IMPACT AND PROCESS EVALUATION OF THE 2012 (PY5) AMEREN ILLINOIS COMPANY COMMERCIAL AND INDUSTRIAL STANDARD EFFICIENCY PROGRAM

Final

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1. EXECUTIVE SUMMARY

This report presents results from the evaluation of the fifth program year of the Ameren Illinois Company (AIC) Commercial and Industrial (C&I) Standard Program for electric and gas energy efficiency. In Program Year 5 (PY5) (June 1, 2012, through May 31, 2013), AIC expected the Standard Program to account for 17% of the overall portfolio electric savings and 30% of the overall portfolio therm savings.[1] Savings from the Standard Program come from the core incentive offering, an Online Store where customers can buy energy-efficient products at reduced prices, and a Green Nozzle offering. In addition, while not formally assessed as part of the PY5 evaluation effort, AIC implemented a pilot Small Business Direct Install (SBDI) program during PY5. [2]

The PY5 evaluation of the Standard Program involved both impact and process assessments. In particular, to support the evaluation we conducted research including a review of program materials and program-tracking data, interviews with program administrators and implementation staff, and site visits to assess large lighting projects. Our quantitative research efforts included a survey with those who utilized the Online Store, and customers who participated in the Core Standard Program. In addition, we conducted a non-participant survey to explore process-related issues and non-participant spillover.

Below we present the key findings from the PY5 evaluation.

Impact Results

Overall, our participant verification activities demonstrated that AIC is accurately tracking what is installed and operating due to the program. As shown in Table 1, all of the program records were fully verified.

Table 1. Standard Program Verification Results

Program Component	Program Tracking (# Measures)	Verified Participation	Verification Rate	Method
Core Program	3,505	3,505	100%	Participant Survey & Site Visits
Online Store	73,148	73,148	100%	Database Review
Green Nozzle	110	110	100%	Database Review

Table 2 below provides the PY5 Standard Program net impacts. In developing estimates of net savings, the team applied the PY3 net-to-gross ratios (NTGRs) for all of the program's components. Overall, the PY5 Standard Program achieved 91,067 MWh in net electric savings and 2,062,981 therms in net gas savings. This level of savings enabled the program to exceed both its internal PY5 electric and gas goals.

[1] Planned portfolio level savings estimates are based on the AIC Plan 2 Filing (September 20, 2011).

[2] The evaluation team reviewed the summary files provided by AIC and included savings from the pilot in the overall impact numbers for PY5. The SBDI program will be evaluated in full during PY6.

Table 2. Standard Program Net Impacts

Program Component	Ex Ante Net			Ex Post Net		
	MW	MWh	Therms	MW	MWh	Therms
Core Program	13	75,261	2,040,058	13	75,130	2,040,058
Online Store	–	18,710	–	–	16,774	–
Green Nozzle	–	110	22,923	–	110	22,923
SBDI Pilot	–	483	–	–	483	–
Total	13	94,564	2,062,981	13	92,498	2,062,981
Net Realization Rate				1.00	0.98	1.00

Process Results

The Standard Program completed another successful year in terms of participant satisfaction, as well as program performance against goals. Based on lessons learned from PY4, the program made a number of adjustments to its design and implementation processes to ensure an easier participation process, as well as the timely submission of projects.

AIC also continued to receive overwhelmingly positive customer feedback on the program. Since its inception, the program has seen high levels of participant satisfaction in nearly all program areas—from program paperwork, to processing incentives, to addressing customer questions and concerns. Consistently performing at this level has likely helped to ensure that participants continue to return to the program year-over-year. However, as findings from the non-participant survey indicate, the program faces challenges in reaching new potential participants. For example, the research shows that only about a third of non-participants are aware of AIC's ActOnEnergy Business Program.

Based on the team's PY5 evaluation activities, we make the following recommendations for the program:

- **Formulate goals for the program's training opportunities**. The introduction of a training program in PY5 is a huge accomplishment for the program. However, while awareness of these opportunities after the first year is moderate, few customers have actually participated, and interest in participating in the future is low. As a result, program staff should determine whether they would like to grow participation in sponsored training activities, or whether simply making them available to customers is sufficient. If growth in this area is a goal in PY6, program staff may wish to consider focus groups or other forms of research with their customers to ensure that the training offered aligns with their goals and interests.

- **Target free lighting kit recipients as part of Core Program and Online Store marketing efforts**. As in prior years, savings from the free lighting kit offer continue to drive Online Store savings. Further, this effort reaches a significant number of customers who generally do not go on to purchase products from the Online Store. In an effort to engage this group of customers and encourage repeat participation, program marketing staff should consider targeted outreach to this group with information about Online Store promotions as well as information on all of the ActOnEnergy Business Program offerings.

2. INTRODUCTION

This report presents results from the evaluation of the fifth program year (PY5) of the AIC C&I Standard Program. The Standard Program is one of three programs within the AIC Commercial and Industrial (C&I) portfolio, which also includes the Custom and Retro-Commissioning programs. In addition, under the umbrella of the Standard Program, AIC offers the Green Nozzle Program and an Online Store initiative described in detail below.[3]

To support the evaluation we conducted research, including a review of program materials and program-tracking data; interviews with program administrators, implementation staff, and trade allies; and site visits to assess lighting measure installation. Our quantitative research efforts included a telephone survey of those who participated in the Standard Core Program, an Internet survey with Online Store participants, and a non-participant survey.

2.1 PROGRAM DESCRIPTION

The C&I Standard Program offers AIC business customers fixed incentives for the installation of specific energy efficiency measures. The program covers lighting, variable-frequency drives (VFDs), HVAC, refrigeration/grocery equipment, and motors. In addition, the program includes an Online Store available to all business customers that offers a variety of energy-saving products, including compact fluorescent lamps (CFLs), exit signs, and vending misers in a convenient and easy-to-use delivery mechanism.

In addition, the program continued to offer the Green Nozzle Program, but on a smaller scale than in prior years. Through this program AIC offers free green nozzles to all AIC gas customers, as well as customers in the food service sector who use electric water heating. The goal of this effort is to replace less flow-efficient nozzles with low-flow green nozzles to reduce the energy use associated with water heating. The effort targets eligible AIC restaurants, commercial kitchens, bar and grills, and other locations that perform food service/food preparation activities.

2.2 RESEARCH OBJECTIVES

The objective of the PY5 Standard Program evaluation is to provide estimates of gross and net electric and gas savings associated with the program. The evaluation team also explored a limited number of process-related research questions. These questions are aimed at exploring the impact of changes made between PY4 and PY5, which focused on application design and process improvements.

The PY5 impact evaluation will answer the following questions:

1. What are the gross energy and demand impacts from this program?
2. What are the net energy and demand impacts from this program?

[3] The PY5 C&I Standard Program also included a pilot Small Business Direct Install (SBDI) effort that was not assessed as part of this evaluation. However, the evaluation team reviewed the summary files provided by AIC and included them in the overall impact numbers for PY5. The SBDI program will be evaluated in full during PY6.

3. Did the program meet its energy goals? If not, why not?

The team addresses the following research questions as part of the process evaluation:

1. Program Participation
   a. What does customer participation look like? How many projects were completed? By how many different customers? What type of projects?
   b. Does customer participation meet expectations? If not, how is it different from expectations, and why?
   c. Does program ally participation meet expectations? How many market actors have joined the Program Ally Network?
2. Program Design and Implementation
   a. Has the program as implemented changed compared to PY4? If so, how, why, and was this an advantageous change?
   b. What implementation challenges have occurred in PY5, and how have they been overcome?
   c. What program marketing and outreach efforts did the program employ in PY5? Are they appropriate for the target market?
   d. Are participants taking advantage of new training and educational opportunities? Among those who have participated, are these program offers useful?
3. Participant Experience and Satisfaction
   a. How satisfied are Online Store participants with their shopping experience? Are they likely to use the Online Store again in the future? Are they likely to participate in other AIC programs?
   b. How satisfied are participants with the enhancements to the program applications in PY5?
4. Opportunities for Program Improvement
   a. What changes could the program make to improve the customer experience and generate greater energy savings?

3. EVALUATION METHODS

3.1 DATA SOURCES AND ANALYTICAL METHODS

The assessment of the fifth program year of the AIC C&I Standard Program included both process and impact analyses. The team focused its PY5 evaluation activities on program impacts while including a focused process assessment. In addition, we gathered data to update the net-to-gross ratio (NTGR) for Standard Lighting for application in PY7. For PY5, we applied the NTGR from PY3, given that the program's implementation has remained relatively consistent, as has the NTGR for this program over the past three program years.

Table 3. Summary of Evaluation Methods

Activity	PY5 Impact	PY5 Process	Forward Looking	Details
Program Staff In-Depth Interviews*		√		Provides insight into program design, processes, and changes since PY4
Core Program Participant Survey	√		√	Gathers data on program processes, as well as data to assess NTGR for PY7
Online Store Participant Survey		√	√	Gathers data to assess installation rates for future use and program processes
Non-Participant Survey		√	√	Gathers data to assess non-participant spillover, as well as potential barriers to participation
Verification Site Visits	√			Confirms installation of lighting measures provided through the program

*Conducted in conjunction with the Custom Program.

3.1.1 PROCESS ANALYSIS

The process analysis used data from two data collection methods: in-depth interviews, and quantitative telephone and Internet surveys. In-depth interviews provided the team with a comprehensive understanding of changes in program design and implementation between PY4 and PY5. We performed these interviews with three program managers, the lead of the marketing team, and the lead C&I database analyst.

The survey efforts touched participants in the Core Program, the Online Store, and non-participants. The team explored program satisfaction, processes, and new offerings with participants, while focusing on program awareness and current practices among non-participants.

3.1.2 IMPACT ANALYSIS

The impact analysis mainly used data from the PY5 program database, project files, and on-site verification visits. The Core participant survey supported the net impact analysis, while the project files and on-site visits were integral to the gross impact analysis.

Per the NTG Framework, we applied the NTGR from PY3 to both gas and electric savings for this program.

Gross Impacts

To estimate PY5 *ex post* gross savings we used a combination of methods, including the application of the Statewide TRM, and on-site verification visits. Table 4 summarizes the approach used for each component of the Standard Program.

Table 4. Standard Program Gross Impact Methods by Component

Program Component	Application of TRM Savings Values	Engineering Review	On-Site Visits
Core Program	X	X	X
Online Store	X		
Green Nozzles	X		

The following sections provide additional details about each of the methods employed.

Engineering Review and Application of Deemed Savings

To determine gross impacts associated with the Core Standard Program, we conducted a review of the program-tracking database and verified the correct application of the Statewide TRM (version 1.0). Engineers also used participant surveys to verify installation values in some cases. We supplemented this process with on-site visits (described below) for large lighting projects.

On-Site Verification Visits

For a sample of Core Standard Program sites that installed lighting measures, the evaluation team conducted on-site verification of measure installation. We chose to conduct on-site visits for these participants, given the large number of measures installed and the difficulty of verifying those project details over the phone. As a result, for these sites, the team verified that the installed measures for which the program participants received an incentive payment were still installed and functioning, and that the quantity was consistent with the number of measures for which the utility paid.

Net Impacts

The team applied the NTGR from PY3 to both the gas and electric programs with the exception of the SBDI pilot effort where we applied the program's planning value. We provide information about the data collected to update lighting and steam trap NTGRs for PY7 in Appendix C. In addition, we assessed non-participant spillover.

3.2 SAMPLING AND SURVEY COMPLETES

The evaluation team conducted quantitative telephone interviews with customers who participated in the Standard Program in PY5. These interviews focused on NTGRs for lighting and program processes. We selected the sample of Core participant projects from the AIC tracking system extract from July 2, 2013. The team developed the Online Store sample based on data from Energy Federation (EFI) in July and August 2013. The following sections outline the sampling approach used for each survey effort.

3.2.1 TELEPHONE SURVEYS

Core Program Participant Survey

We developed the Standard survey sample based on a customer's measure end-use. In addition, we conducted sampling for the participant survey at the level of the project contact, rather than the project. This was necessary because as in previous program years, some customers completed more than one project in PY5. These businesses generally submitted the same contact name for different projects. As a result, to avoid respondent burden, we asked each contact about only one project. In total, the team identified 751 unique customer contacts for the Standard survey, and the sample frame was based on these contacts.[4]

Because some of the questions in the survey were specific to projects (e.g., decision-making processes that led to the installation of the incented equipment), each contact with multiple projects was assigned a single project.[5] If a contact had multiple projects of the same end-use (e.g., lighting), we asked about the project with the largest savings.[6] If a contact had projects that included different end-uses (including lighting), we asked about the largest non-lighting end-use. This approach was intended to ensure that our sample would include a sufficient number of non-lighting projects, since lighting continued to be the predominant end-use in PY5.

As in prior years, based on the volume of lighting projects completed through the Standard Program, we divided the sample frame into lighting and non-lighting components, and stratified the lighting sample frame to identity the largest projects based on savings. In particular, we stratified the sample of lighting projects as follows: small savings up to 25,000 kWh, medium savings between 25,001 and 250,000 kWh, and large savings greater than 250,001 kWh. We performed this stratification using the Dalenius-Hodges method to determine strata boundaries, and the Neyman allocation to determine the optimal allocation of the available interviews to the strata.

The purpose of stratifying the sample of lighting projects in particular is to ensure that sample is as efficient as possible, i.e., it will achieve the targeted level of confidence and precision (a confidence level of 90% and a precision level of 10%) with the smallest sample). To increase the chances of achieving this level of confidence and precision for lighting projects, we attempted a census of the largest projects and a random sample of the smaller-size projects. Table 5 below shows the stratification approach and completed lighting surveys. Appendix C documents weighting performed to develop program-level parameters such as the NTGR.

[4] Please note that the evaluation team also removed any participants who received a staffing grant in PY5 or also completed a Custom project. We chose to conduct separate interviews with these customers.

[5] In total, 144 contacts had multiple projects.

[6] As documented in Appendix C on NTGR results, the team included a question in the survey about other projects completed by the contact in order to determine whether the NTGR for the selected project was generalizable to the projects that were not selected.

Table 5. Sample Design for Standard Lighting

Strata	kWh Savings Range	Number of Projects[a]	Target Interviews	Completed Surveys
Small Lighting	0-25,000	610	26	27
Medium Lighting	25,001–250,000	193	32	32
Large Lighting	250,001-4,500,000	42	Census Attempt	9
Total		**845**		**68**

[a] These figures are based on the July 2, 2013, version of AIB. It includes projects with a status of "Check Cut" or "Check Queued." As a result, project counts differ from the final data presented later in this report.

Overall, we developed two, mutually exclusive sample frames for lighting and non-lighting projects. As noted above, for lighting, we stratified by total kWh savings and for non-lighting projects, we attempted a census. Table 6 below presents the population values and survey information for the Core Standard Program.

Table 6. Completed Standard Core Program Survey Points

End-Use	Database Population (Standard Only)				Sample Frame: Contacts (Standard Only)			Completed Surveys		
	Projects	Contacts	MWh Savings	Therm Savings	Contacts	MWh Savings	Therm Savings	Contacts	MWh Savings	Therm Savings
Lighting	845	560	220,588	–	496	31,199	–	68	7,702	–
HVAC	156	128	7,332	200,635	108	1,032	50,550	50	410	21,463
Motor	59	44	65,683	–	36	14,552	–	15	5,574	–
Refrigeration	48	6	2,097	1,192	4	41	596	1	7	–
Water Heater	19	18	10	14,162	13	–	8,134	7	–	2,679
Steam Trap	24	21	0	978,630	19	–	322,605	6	–	184,187
Commercial Kitchen	3	3	21	3,604	2	3	–	1	3	–
Agriculture	1	1	205	–	1	68	–	1	68	–
Leak Repair	9	9	1,341	–	7	1,223	–	4	843	–
Total	**1,161**[a]	**751**[b]	**297,278**	**1,198,222**	**686**	**48,120**	**381,885**	**153**	**14,607**	**208,329**

[a] Note that three projects involved more than one end-use. As a result, this column does not sum to this value, which is the total number of completed projects as of July 2, 2013.

[b] This number is not equal to the total within this column due to the fact that some contacts have more than one end-use. 751 is the number of unique contacts.

We used the survey to gather data to support the estimation of NTGRs for lighting projects since the implementation of EISA, as well as for steam traps. This sample design provides statistically valid NTGR results at the 90% confidence level ±8% precision for the Standard Program lighting projects on a kWh basis. For steam traps, we attempted a census, and therefore there is no sampling error associated with the NTGR results. For all other project types, we gathered data on program processes and attempted a census. Therefore, there is no sampling error.

Survey Dispositions and Response Rate

We fielded the survey with Standard Program participants from August 13 through August 29, 2013. Table 7 provides the final survey dispositions.

Table 7. Standard Core Program Survey Dispositions

Disposition	N
Completed Interviews (I)	153
Partial	3
Eligible Non-Interviews	187
Refusal	40
Mid-Interview Terminate (R)	16
Respondent Never Available (NC)	95
Answering Device	35
Language Problem (NC)	1
Not Eligible (e)	22
Fax/Data Line	2
Non-Working	8
Duplicate Number	7
No Eligible Respondent	5
Unknown Eligibility Non-Interview (U)	321
Not Dialed/Worked	295
No Answer	26
Total Participants in Sample	**686**

Table 8 provides the response and cooperation rates. Appendix B provides information on the methodology used to calculate response rates for telephone surveys.

Table 8. Standard Program Survey Response and Cooperation Rates

AAPOR Rate	Percentage
Response Rate	23%
Cooperation Rate	72%

The team compared survey respondents with those who did not respond to the survey in order to assess the potential for non-response bias. We found no evidence to suggest that non-respondents differed from respondents in terms of end-use, number of projects or project savings.

Weighting

The team developed and applied the following survey weights for the process analysis.

Table 9. Standard Survey Weights

Project Type	Sample Frame		Completes		Weight	
	Total Part.	% Part.	Total Part.	% Part.	Total Part.	Weight
Lighting	935	72%	68	44%	110	1.6220
Non-Lighting	362	28%	85	56%	43	0.5024
Total	1,297	100%	153	100%	153	2.12

Non-Participant Survey

We developed the non-participant survey sample based on a data file provided by AIC containing business customers from all rate classes that had never participated in the ActOnEnergy Business Program. From this data, we developed two sample frames: one containing gas-only customers, and another containing electric-only and combination (gas and electric) customers. The sample frames included all unique commercial and industrial customers based on account number and telephone number. During preparation of the sample frames, we removed any customers for which we did not have rate code information and therefore could not classify as gas-only, electric-only, or combination. In addition, we chose to exclude customers in the DS4 and GS4 rate codes (large gas and electric accounts), given their small overall numbers in the population and low likelihood of being reached through the survey.

Table 10. Non-Participant Sample Design

Sample Group	Customer Type	Sample Frame	Percent of Total
Gas	Gas-Only	21,500	24%
Electric/Combo	Electric-Only	93,729	59%
	Both	37,908	13%
	Subtotal	153,137	96%
Dropped	Missing Rate Code	7,009	4%
Total		**160,146**	**100%**

We used this two-frame approach in order to ensure sufficient coverage of gas customers and associated gas measures. From the two sample frames, we drew a simple random sample. Table 11 outlines the approach implemented for this survey.

Table 11. Completed Non-Participant Survey Points

Customer Type	Sample Frame	Initial Sample Selected for Interviewing	Completed Survey
Gas-Only	21,500	2,200	73
Electric/Combo	131,637	5,500	178
Total	**153,137**	**7,700**	**251**

The evaluation team concluded that an un-weighted analysis for the non-participant results provided the best representation for process results, given the alignment of respondents with the population in terms of customer type. The analysis largely features the reporting of response frequencies, and we decided to give equal weight to each response.

Overall, the sample design provides statistically valid spillover results at the 90% confidence level, ±16% precision based on sampling.

Survey Dispositions and Response Rate

We fielded the survey with non-participants from August 15 through August 29, 2013. Table 12 below provides the final survey dispositions.

Table 12. Non-Participant Survey Dispositions

Disposition	N
Completed Interviews (I)	251
Eligible Non-Interviews	2,725
Refusal (R)	1,031
Mid-Interview Terminate (R)	112
Respondent Never Available (NC)	856
Telephone Answering Device	714
Language Problem (NC)	12
Not Eligible (e)	2,061
Duplicate Number	3
Fax/Data Line	80
Non-Working	657
Wrong Number	175
Business/Government/Other Org.	233
No Eligible Respondent	913
Unknown Eligibility Non-Interview (U)	1,224
Not Dialed/Worked	694
No Answer	500
Call Blocking	11
Busy	19
Total Participants in Sample	**6,261***

*Note: This number differs from that presented in Table 11, as not all pieces of the sample were ultimately loaded.

Table 13 provides the response and cooperation rates. Appendix B provides information on the methodology used to calculate response rates for telephone surveys.

Table 13. Non-Participant Survey Response and Cooperation Rates

AAPOR Rate	Percentage
Response Rate	8%
Cooperation Rate	18%

3.2.2 INTERNET SURVEYS

Online Store Participant Survey

The evaluation team conducted a quantitative Internet survey with customers who purchased products through the Online Store, or requested and received a free lighting kit in PY5 and had a valid email address on file. The survey focused on program processes and satisfaction. We conducted the survey with a sample of participating customers drawn from EFI invoice data files.

As shown in the Table 13, the sample preparation process involved removing those without any email address, those with an invalid email address, duplicate valid e-mail addresses, and records for which either no savings were claimed or where the savings were set to zero. Table 15 below presents, for each product type, the sample frame, valid sample frame for measures, and completed interviews. The valid sample frame represents customer records that contained a valid and unique email address.[7]

Table 14. Online Store Sample Cleaning

Record Description	Number of Records
Total Invoice Records	16,436
Missing Email	7,294
Savings Not Claimed	60
Quantity Zero	72
Duplicate Email	1,254
Invalid Email	1,406
Final Contacts in Sample	**6,350**

We attempted a census of all participants with valid and unique email addresses. As such, there is no sampling error associated with the results. Table 15 shows that the sample of completed interviews closely resembles the sample frame. Note that a single respondent can appear more than once in the table, as he or she could have purchased more than one product.

Table 15. Completed Online Store Survey Points

Product Type	Sample Frame		Valid Sample Frame Measures		Completed Surveys	
	#	%	#	%	#	%
Free Kit (3 CFLs/3 LEDs)	7,177	44%	3,072	45%	200	46%
Free CFLs (6-Pack)	5,999	37%	1,965	29%	128	29%
Free Kit (4 CFLs/2 LEDs)	1,564	9%	746	11%	18	4%
LED Light Bulbs	773	5%	544	8%	42	10%
LED Exit Signs	223	1%	176	3%	19	4%
Spiral (or Twisted) CFLs	210	1%	117	2%	7	2%
T8 Ballasts	136	1%	84	1%	8	2%

[7] A full listing of all measures distributed through the online store can be found in Table 25.

Product Type	Sample Frame		Valid Sample Frame Measures		Completed Surveys	
	#	%	#	%	#	%
Specialty Application CFLs	128	1%	84	1%	9	2%
Motion Sensors	109	1%	45	<1%	2	<1%
T8 Bulbs	51	<1%	9	<1%	4	1%
Vending Machine Controls	41	<1%	20	<1%	2	<1%
LED Exit Sign Retrofit Kits	12	<1%	9	<1%	0	0%
LED Downlights	1	<1%	1	<1%	0	0%
Total Measures	**16,424**		**6,872***		**439***	

* Note that a single respondent can appear more than once in the table, as he/she could have purchased more than one product. The total number of respondents that we spoke with is 396.

Survey Dispositions and Response Rate

We fielded the survey with participating customers between August 28 and September 16, 2013. It is important to note that the total number of emails sent does not match As shown in the Table 13, the sample preparation process involved removing those without any email address, those with an invalid email address, duplicate valid e-mail addresses, and records for which either no savings were claimed or where the savings were set to zero. Table 15 below presents, for each product type, the sample frame, valid sample frame for measures, and completed interviews. The valid sample frame represents customer records that contained a valid and unique email address.

Table 14 above, given that a customer may have purchased more than one product. For example, if one customer purchased both spiral CFLs and LED lights, they would count as one respondent, but be counted twice (once for both measures) for the purposes of sampling.

Table 16. Online Store Survey Dispositions

Disposition	N
Total Emails Sent (to Unique Customers)	6,350
Completes (Product Level)	396
Bounce Backs	1,348
Known Ineligible (Replied with Reason)	10
Known Ineligible (Screened Out)	19
Refused (Replied but Refused)	9
No Response	4,400
Eligible	**4,973**
Ineligible	**1,377**
Response Rate (Completes/Eligible)	**8%**

3.2.3 ON-SITE VERIFICATION

The evaluation team selected a sample of 40 large lighting projects for site verification. In particular, we drew our sample from a sample frame containing all lighting projects with *ex ante* savings of 50,000 kWh or more. We chose the sample using a stratified random sampling design employing the Dalenius-Hodges method to determine strata boundaries, and the Neyman allocation to determine the optimal allocation of the available visits to the strata. We based the sample on the AIB database extract provided on July 2, 2013.

Table 17 summarizes the sample selected and the total number of sites we visited.

Table 17. Lighting Verification Site Visit Sampling Approach

Sampling Strata	KWh Savings Range	Number of Projects	Site Visit Sample	Site Visits Completed
1	50,000–100,000	115	3	3
2	100,001–500,000	110	24	27
3	More than 500,000	15	13	10
Total		**240**	**40**	**40**

The final sample design provides statistically valid verification results at the 90% confidence level ±2% on a kWh basis. To calculate relative precision, the team first determined the variance in the sample and then calculated the standard error and confidence interval. Figure 1 below outlines the equations used.

Figure 1. Equation for Calculating Precision for Lighting Verification Visits

$$standard\ error = \sqrt{variance}$$

$$90\%\ Confidence\ Interval = 1.645 * standard\ error$$

$$Relative\ Precision = \frac{Confidence\ Interval}{\hat{R}}$$ [8]

[8] Where $\hat{R}$ is the realization rate.

4. RESULTS AND FINDINGS

4.1 CORE PROGRAM PROCESS FINDINGS

The evaluation team performed a targeted process evaluation of the PY5 program, focusing mainly on program awareness, program experience, and barriers to participation, as well as associated program implementation changes in this area. Results are based on in-depth interviews, a review of program data, and a non-participant survey.

4.1.1 PROGRAM DESCRIPTION AND PARTICIPATION

The C&I Standard Program offers AIC business customers fixed incentives for the installation of specific energy efficiency measures. The program covers a wide range of measures, including lighting, variable-frequency drives (VFDs), HVAC, refrigeration, steam traps, and motors. In addition to standard incentives, the program features an Online Store available to all business customers, which offers a variety of energy-saving products—including compact fluorescent lamps (CFLs), exit signs, and vending misers—at discounted prices. This participation channel uses free shipping, making it a convenient and easy-to-use mechanism. It is discussed in greater detail in Section 4.2

The Standard Program also includes the Green Nozzle initiative. This effort, which is in its fourth year, ramped-down significantly in PY5, with a very small number of measures distributed. The green nozzle offering has traditionally seen high and low years based on the needs of the Standard Program overall, and the reach of the offering in prior years.

Program Participation

Standard Participants and Measures

The number of projects in the PY5 program was 1,297, which is lower than PY3 with 1,557 projects and PY4 with 1,560 projects. In terms of contributions to savings, the majority of projects produce electric savings, while Standard HVAC and steam trap projects contribute the most to gas savings.

In terms of the different project types seen in PY5, almost three-quarters of projects involved lighting. Table 18 below presents a summary of the projects completed in PY5 by project type. In general, these percentages are consistent with prior years. However, it is important to note that in PY5, the program introduced the specialty equipment category, which contains a range of projects such as refrigeration, commercial cooking, and agriculture. In prior years, these measures were assigned a project type classification that aligned with the specific end-use or measure type in question.

Table 18. Summary of Participation by End-Use

Project Type	Projects		*Ex Ante* Gross Electric Savings		*Ex Ante* Gross Gas Savings	
	#	%	MWh	%	Therms	%
Standard Lighting	935	72%	56,295	57%	–	–
Standard HVAC	192	15%	6,636	7%	94,129	5%
Specialty Equipment	67	5%	2,948	3%	3,604	0%
Standard Motor	53	4%	27,569	28%	–	–

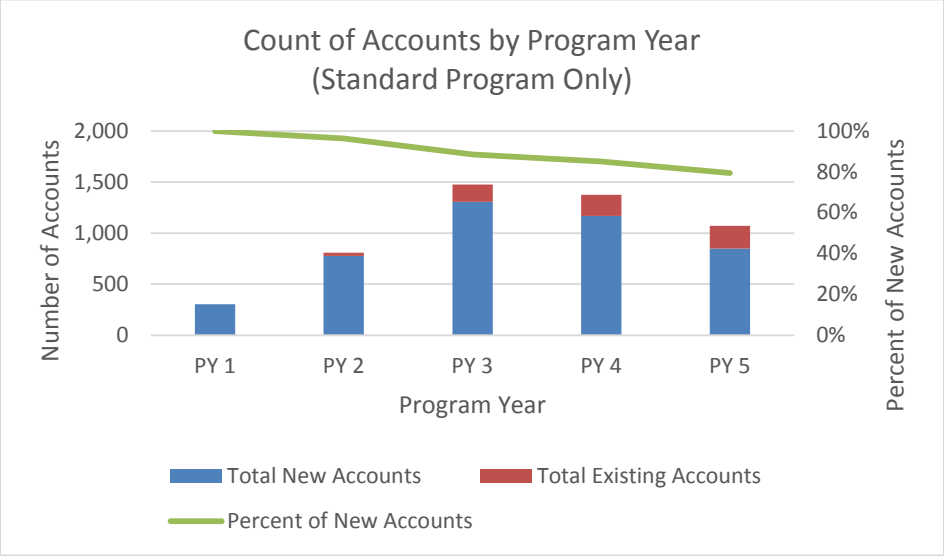
Project Type	Projects		*Ex Ante* Gross Electric Savings		*Ex Ante* Gross Gas Savings	
	#	%	MWh	%	Therms	%
Steam Trap	35	3%	–	–	1,942,326	95%
Leak Survey and Repair	15	1%	5,296	5%	–	–
Total	**1,297**		**98,744**		**2,040,058**	

A typical Standard Program participant considers itself to be a small (48%) for-profit (83%) company. Participants typically own, rather than rent, a facility (83%) that is at least 30 years old (68%). The workforce within these companies is typically between 10 and 49 employees (44%), and almost all participants pay their own gas and electric bills (99%).

Historical Participation

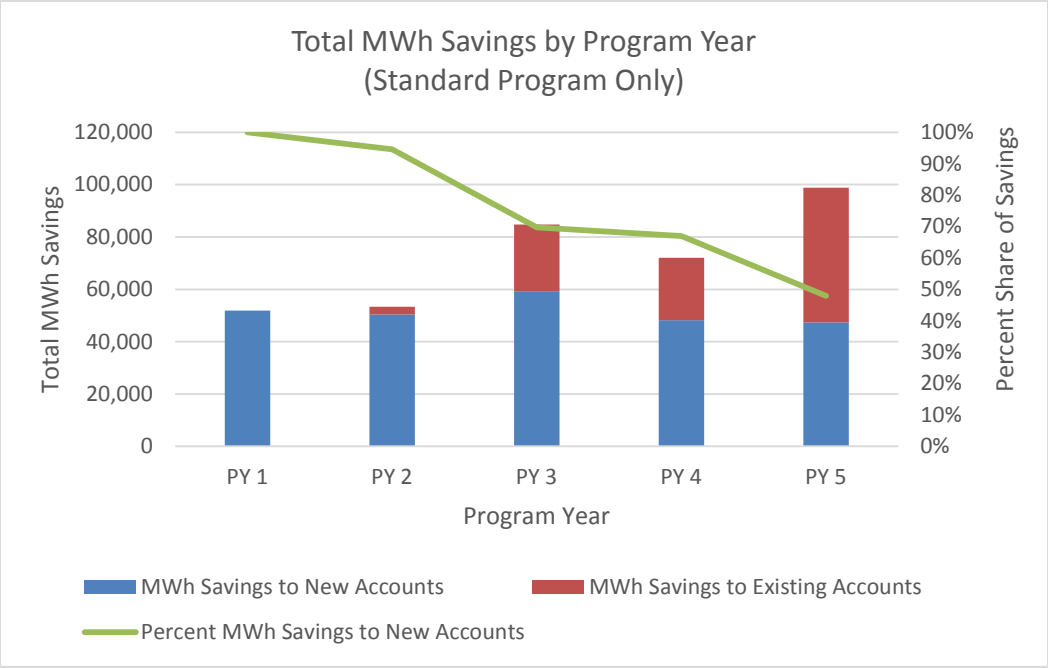
As part of the team's review of PY5 participation, we reviewed AIB data from PY1 through PY5 in order to identify trends in participation over time. As shown in Figure 2 below, there has been a decline in the number of accounts participating in the Standard Program each year since PY3. However, repeat participation (as show by the total existing accounts) has increased somewhat over time as a percent of all participating accounts.

Figure 2. Standard Program Participation by Account (PY1-PY5)



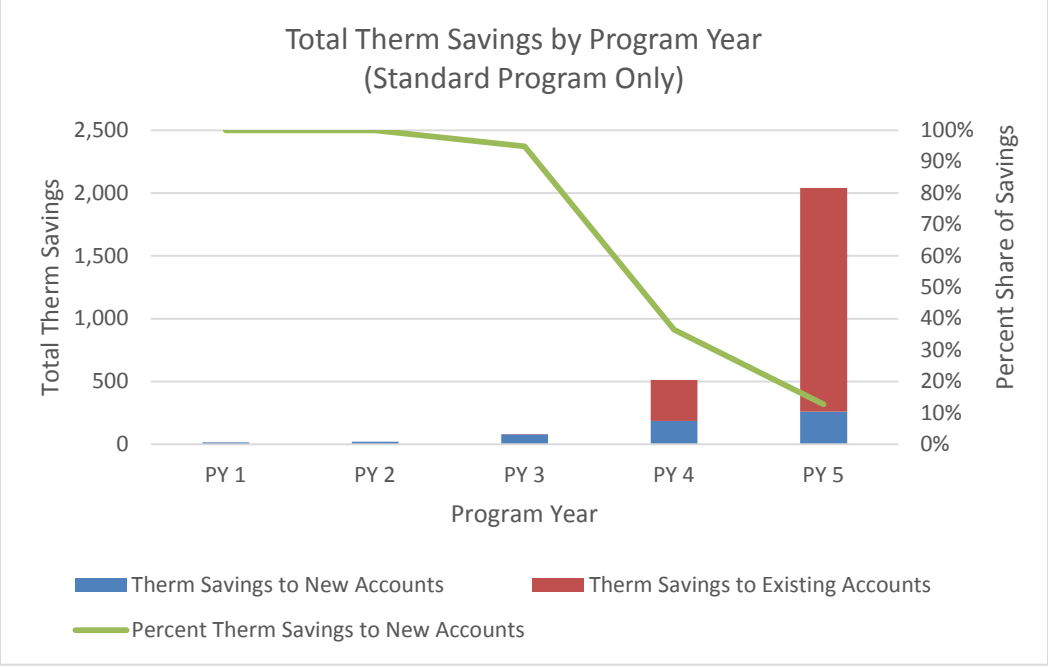
Further, this decline in the number of accounts has not had an impact on savings achieved through the program. For example, as show in Figure 3 below, total MWh savings increased in PY5, with a significant amount coming from past participants.

Figure 3. Standard Electric Savings by Program Year



A similar trend is evident when looking at gas savings, as shown in Figure 4. However, the contribution from past participants (i.e., existing accounts) is extremely high.

Figure 4. Standard Therm Savings by Program Year



Note: The gas program did not officially start until PY4.

Green Nozzle

In PY5, 68 unique companies[9] participated in the Green Nozzle initiative, installing 110 green nozzles. These numbers represent a substantial decrease compared to PY3 and PY4.

Table 19. Summary of Green Nozzle Participation

Program Year	Green Nozzles Installed	Verified Gross Savings	
		MWh	Therms
Program Year 3	1,301	–	1,481,428
Program Year 4	960	4,629	988,971
Program Year 5	110	134	22,923

4.1.2 PROGRAM DESIGN AND IMPLEMENTATION

Based on both the participant survey and interviews with program staff, the C&I Standard Program continued to function smoothly and effectively in PY5.

Core Program

The program changed incentive levels for several measures in PY5, and added some measures that had previously fallen within the scope of the Retro-Commissioning Program (leak survey and repair). In addition, the program made significant changes to all application forms to comply with the Statewide TRM. As part of this process, a number of measures were both added to and removed from the program. The program also adjusted some HVAC and lighting incentives.

In addition, the program began offering various training opportunities to customers in PY5. This effort included live training webinars, on-demand web-based courses, and live classroom seminars and workshops focused on energy efficiency.

Program Ally Bonus Structure

The program implemented a new bonus incentive structure for program allies, consisting of a percentage bonus and a threshold bonus. The former provided an 8% match of customer incentives for projects completed by the end of December 2012 and 2% for the months thereafter until the end of April 2013. The threshold bonus provides allies with $500 for every 250,000 kWh and $100 for every 2,000 therms (cumulative) for projects completed by the end of April 2013. These changes were meant to encourage early completion of customer projects, as well as additional savings.

Marketing and Outreach

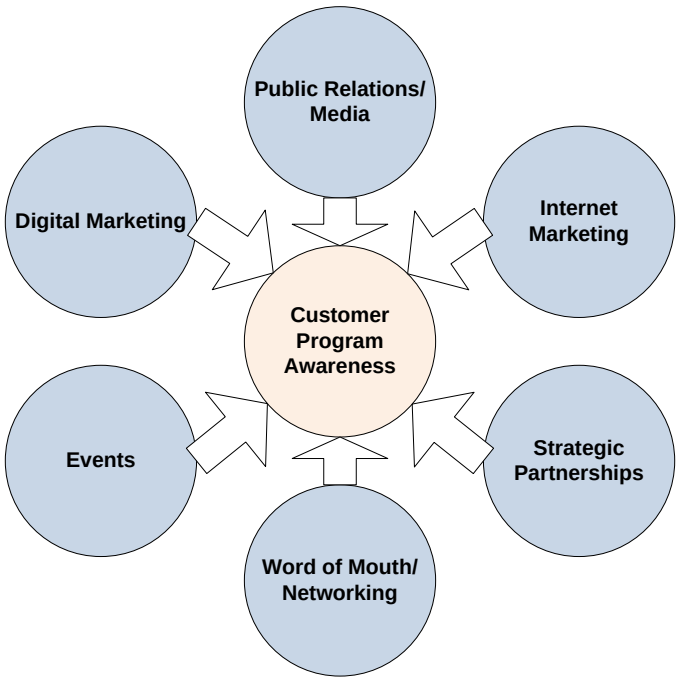
Overview of Marketing Strategy

After focusing on building a strong marketing team in PY4, AIC and SAIC focused their marketing efforts in PY5 on expanding awareness of the program, trying to reach customers with measures

[9] The number of unique customers is based on account number.

relevant to their business needs, and communicating why customers should participate in the program. In general, the program implementation team identified six main marketing strategies for PY5, as shown in Figure 5.

Figure 5. PY5 Communication Channels



While the program leveraged each of these strategies, some played a more important role in PY5 than others. In particular, AIC used email, web analytics, search engine marketing (SEM), and online advertising as part of its Internet marketing efforts. In particular, program staff have made an effort to acquire and leverage customer email addresses through a variety of means, such as requesting an email address from customers who take advantage of free lighting kit offers. These efforts have expanded the circulation of AIC newsletters.

In addition, the ActOnEnergy website also serves as a powerful tool. Not only has AIC made an effort to drive traffic to the site using other marketing channels, but they also updated the website based on lessons learned from PY4 focus groups. Further, AIC has implemented analytics that allow the tracking of site metrics as well as the tracking of individual customers through unique URLs in order to monitor the success of specific efforts.

Beyond Internet marketing, the implementation team utilizes a range of other tactics to reach AIC business customers.

- **Direct Marketing**: This marketing channel consists of print ads, direct mail and bill inserts, brochures, case studies, flyers, and branded materials. Use of this marketing channel was limited to specific audiences in PY5.

- **PR/Media**: Through press releases, media events, and "big-check" presentations, AIC has continued to widen program exposure through the public relations channel. By recognizing the Most Progressive Cities within its service territory, AIC has also increased media attention on energy efficiency and the ActOnEnergy Program.

- **Events**: AIC continued to host a customer symposium, and offered attendees a 15% coupon for additional incentives. AIC also worked with a third party to collect interviews with a variety of stakeholders in order to inform planning for the symposium and other events. The symposium drew approximately 600 people, the largest attendance so far.

- **Strategic Partnerships**: In an effort to build relationships with various organizations and their members, there was an increase in sponsorships offered to professional associations in PY5. This is a targeted channel that helps to increase awareness of AIC and its offerings among specific targeted communities.

- **Word of Mouth/Networking**: This channel attempts to engage associations, community groups, and program allies to spread awareness. Community groups, such as chambers of commerce, act as targeted communication channels, especially for small businesses. In PY5, AIC continued to develop and strengthen these relationships, hosting "Lunch and Learn" events to increase program exposure among their members, and driving interest in the annual customer symposium.

Program Outreach

Overall Program Awareness in Non-Participants

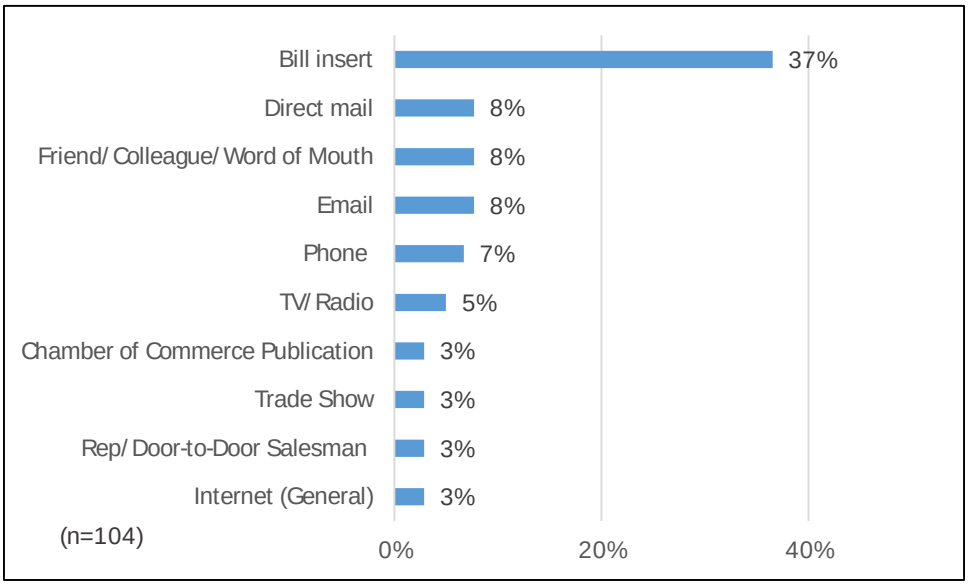
We found that non-participants had moderate levels of awareness of AIC sponsored energy efficiency programs in general, but low awareness of the ActOnEnergy Business Program (35%) name. However, the percentage of respondents aware of the ActOnEnergy Business Program increased from 35% to 41% when the program was described to respondents.[10]

While awareness of the ActOnEnergy Business Program is moderate among non-participants, those aware of the program are even less familiar with the program details. While 6% of non-participants indicate that they are very familiar with the program, close to half (47%) of non-participants say they are somewhat familiar with the program. Based on these findings, it is clear that there is still room for increased program outreach to this customer segment.

In terms of reaching these potential participants with program information, bill inserts (37%) are the most commonly recalled source of information. Among these who encountered program information through multiple channels, respondents cited direct mail materials (including direct mail flyers and bill inserts) as the method that was most effective at communicating information about the program (30%).

[10] The AIC ActOnEnergy Business Program offers incentives for energy-efficient equipment upgrades and improvements including lighting, cooling, refrigeration, and motors.

Figure 6. Sources of Program Awareness among Non-Participants



Marketing Exposure in Participants

Participants report exposure to a variety of marketing and outreach efforts. In particular, participants most frequently cite program allies (87%), email (56%), and the AIC website (47%) as sources of information about the program, which is consistent with the PY5 marketing strategy.

We also identified some interesting differences in marketing exposure among participants. As shown in **Error! Not a valid bookmark self-reference.**, self-described large businesses were significantly more likely to have encountered program information through Internet marketing (email and the AIC website). However, self-described small businesses experienced lower levels of exposure to almost every marketing channel with the exception of program allies. This finding is consistent with information about how smaller customers learn about the program. For example, when asked how they learned of opportunities for AIC incentives, small companies were significantly more likely to have heard of the opportunity through a contractor (Small 53%, Medium 26%, Large 17%).

Table 20. Standard Program Marketing Channel Exposure

Channel	All (n=153)	Business Size			Project Type	
		Small (n=74) (A)	Medium (n=44) (B)	Large (n=26) (C)	Lighting (n=68) (D)	Non-Lighting (n=85) (E)
Program Ally	87%	85%	88%	88%	90%[e]	79%
Email	56%	42%	60%[a]	76%[A]	53%	64%
AIC Website	47%	40%	44%	62%[a]	43%	56%[d]
KAE or AIC Staff	46%	43%	43%	46%	44%	49%
Bill Insert	44%	48%[c]	50%[c]	26%	40%	55%[d]
Print Ad	43%	39%	46%	52%	46%	35%
Radio Ad	25%	16%	34%[a]	36%	25%	26%
Event	21%	6%	37%[A]	30%[A]	21%	21%
Billboard	19%	17%	23%	24%	18%	24%

Note: Uppercase letters within a cell indicate significance at the 95% level between the value in that cell and the value corresponding to the letter column. Lowercase letters indicate significance at the 90% level.

While most respondents (81%) found the program's marketing materials at least somewhat useful, a third found them very useful (30%). Further, participants who completed non-lighting projects are significantly more likely to report that the marketing materials they saw were very useful (45%), compared to lighting project participants (25%). Among the small number of participants who did not find the marketing materials useful, most would have liked more-detailed program information.

The team also sought to understand participants' information-seeking practices in an effort to identify potential gaps in the program marketing strategy. As a result, we asked participants where they typically look for information about how to save energy. The most common response was the Internet (71%), followed by AIC (23%), and contractors (10%). These findings generally align with AIC's core outreach strategies, particularly efforts to improve the program website and web-based resources, establish connections and a presence within the service territory, and support the Program Ally Network.

Table 21. Standard Program Preferred Marketing (Multiple Response)

Preferred Channel	Percentage of Participants (n=153)
Internet	71%
AIC/Utility	23%
Contractor	11%
AIC Website	4%
Coworkers/Internal Resource	2%
Trade Organizations/Publications	2%
Supplier	0%
Other	1%

Don't Know	3%

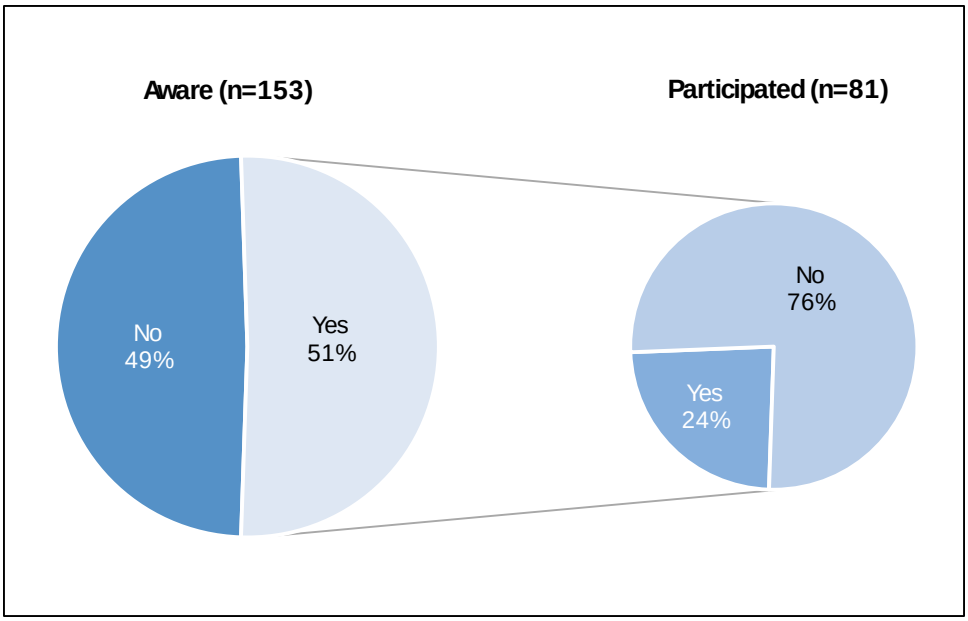
In order to determine whether program participants see AIC as a trusted energy advisor, we asked those who did not mention AIC (un-aided)[11] whether they considered the company a resource for energy efficiency information. Among this group, 90% agreed, bringing the total percentage of participants who consider AIC a resource for energy efficiency information to 92%. This illustrates AIC's success in establishing the utility's image as a trusted advisor.

Webinars and Training

The program achieved its goal of offering a comprehensive training program for business customers in PY5. Based on their efforts to promote these learning opportunities, we found that awareness of AIC-sponsored training is moderate, with half of program participants (51%) stating that they are aware of live training webinars, on-demand web-based courses, and live classroom seminars and workshops focused on energy efficiency. Among those aware of these training offerings, most say that they heard of them through an email or mailing list (62%), while the next most common source of training information was searching online (17%) or specifically the AIC website (8%).

Despite making inroads in educating customers about the existence of training opportunities, very few customers (24%) have taken advantage of them, as shown in Figure 7. However, among those who participated, all found the training to be at least somewhat useful, and half (52%) of the attendees overall found the training very useful.

Figure 7. Awareness and Participation in Training Opportunities



In general, while interest in future training exists, it is not strong. For example, when we asked all respondents how likely they were to participate in AIC training opportunities in the future (on a 10-

[11] Overall, 27% mentioned AIC un-aided (AIC/utility response (23%) and AIC website response (4%)).

point scale, where 0 is "not at all likely" to participate in the future and 10 is "very likely" to participate in the future), the mean score was 4.6. While medium-sized businesses are significantly more likely than small businesses to participate in future training (5.6 vs. 3.7), overall interest is low.

Among those who are not likely to participate (46%) (i.e., a rating of less than 5 on the previous likelihood question), the main reasons are a lack of time (43%), followed by the impression that the trainings offered were not applicable to their job or business (23%). Based on this feedback, AIC may want to learn from customers about the type of training they would find most useful, and modify the current offerings if appropriate.

Table 22. Reasons Why Participants Are Unlikely to Take Advantage of Training (Multiple Response)

Reason	Percentage of Respondents (n=70)
No time	43%
Not interested/not applicable to business in general	23%
Already energy-efficient	11%
Not responsible for this/trainings/not my department	8%
Training isn't for small businesses like mine	6%
Already have experts on staff/internal resources	6%
Take advantage of training elsewhere	3%
Associated costs	3%
Don't know enough about them	1%
Other	1%

4.1.3 PARTICIPANT EXPERIENCE AND SATISFACTION

Program Process and Effectiveness

In general, the PY5 application process remained consistent with PY4. However, AIC and SAIC took steps to simplify the application and provide for partial automation of application forms. The application forms have been converted to fillable-PDF format that make savings and incentive calculations automatically, which increases ease-of-use as well as accuracy. In addition, Standard Program projects with incentive requests less than $10,000 no longer require technical screening or pre-approval. This change from PY4 simplified the application process for a large majority of the lighting applicants.

While participants often work with a contractor, a majority (60%) filled out the application forms themselves, and half of those submitted the form electronically (35%). Most respondents (88%) said that the application forms clearly explained the program requirements and how to participate, which is consistent with results from PY2 and PY3. Also consistent with prior program years, half of the Standard Program respondents (53%) found the application process to be easy (score of 8-10 on a 10-point scale where 0 is "very difficult" and 10 is "very easy"). The few (4%) who felt the process was difficult (0-3 on a 10-point scale) said that they found the paperwork to be lengthy and

challenging. In general, these findings indicate that while the changes made in PY5 have made it somewhat easier to complete an application, relatively high levels of satisfaction with the process have been maintained.

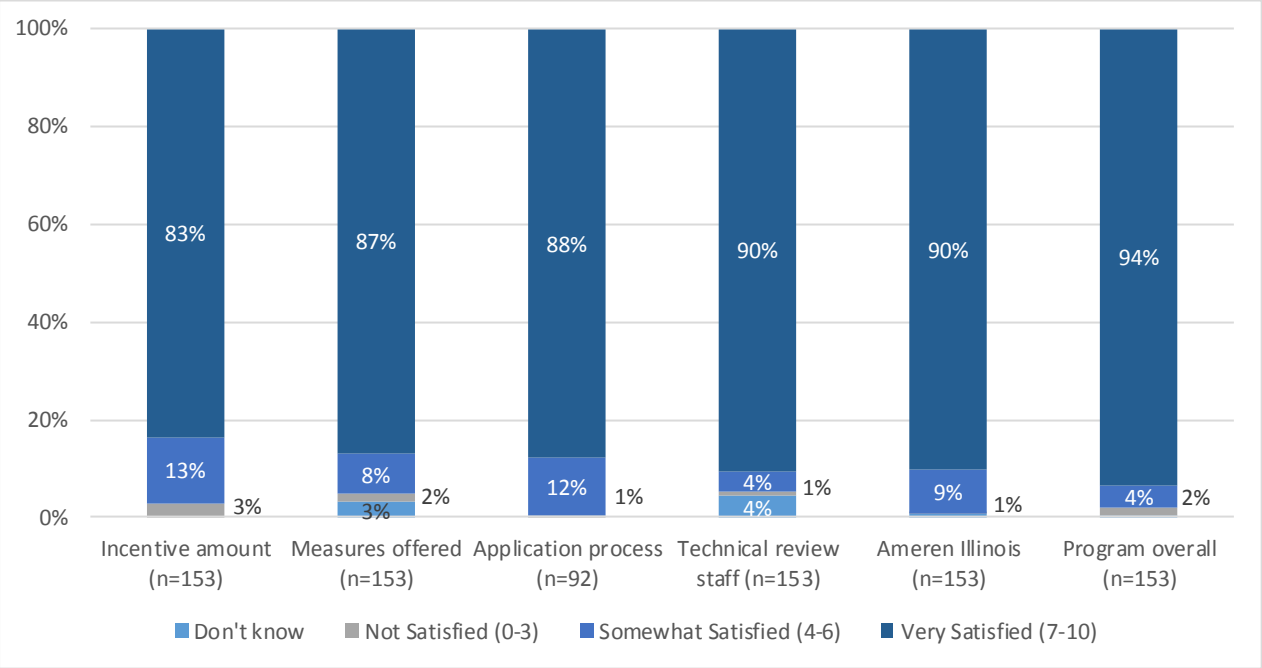
Overall, participants continue to find it easy to participate in the AIC C&I Standard Program. In fact, almost all participants (91%) reported no problems with the participation process overall. Among the few who reported problems (n=14), some cited difficult or lengthy paperwork (9/14), or inconsistent or hard-to-obtain program information (7/14).

Participant Satisfaction

Core Program Satisfaction

Nearly all participants in the Standard Program are satisfied with the program overall (94%) and their communication with technical review staff (90%). Most participants are also satisfied with the application process (88%), the measures offered (87%), and the incentive amounts offered (83%). These results indicate that the program staff continue to offer excellent program implementation and customer service.

Figure 8. Program Satisfaction by Program Component



Note: Questions based on a 10-point scale where 0 is "Very Dissatisfied" and 10 is "Very Satisfied."

Based on the positive experiences of participating customers, overall the program appears successful in generating customer interest in future energy efficiency projects. For example, a strong majority (68%) plan to participate in the AIC ActOnEnergy Business Program in the future, while an additional 16% said that they might participate.

The team also found some interesting differences across participant types, in terms of their intent to participate again. For instance, businesses describing themselves as large and medium in size are significantly more likely (84% and 74%, respectively) than self-described small businesses (56%) to participate in the future.

Table 23. Participant Plans for Future Participation

Plan to Participate Again	All (n=153)	Customer Size			Project Type	
		Small (n=74) (A)	Medium (n=44) (B)	Large (n=26) (C)	Lighting (n=68) (D)	Non-Lighting (n=85) (E)
Yes	68%	56%	74%[a]	84%[A]	65%	78%[d]
Maybe	16%	17%	19%	10%	16%	16%
No	13%	21%[BC]	7%	6%	16%[E]	5%
DK/Refused	2%	6%	-	-	3%	1%

Note: Not all categories total to 100% due to rounding. Uppercase letters within a cell indicate significance at the 95% level between the value in that cell and the value corresponding to the letter column. Lowercase letters indicate significance at the 90% level.

4.1.4 OPPORTUNITIES FOR PROGRAM IMPROVEMENT

Over half of participating customers (53%) do not think the program needs to make any changes or improvements. However, among those with recommendations for how the program could be improved, participants mentioned a wide range of things (see Table 24 below). These include shortening and simplifying the program paperwork in general (13%), offering higher incentives (12%), and providing more measures and incentives (4% each).

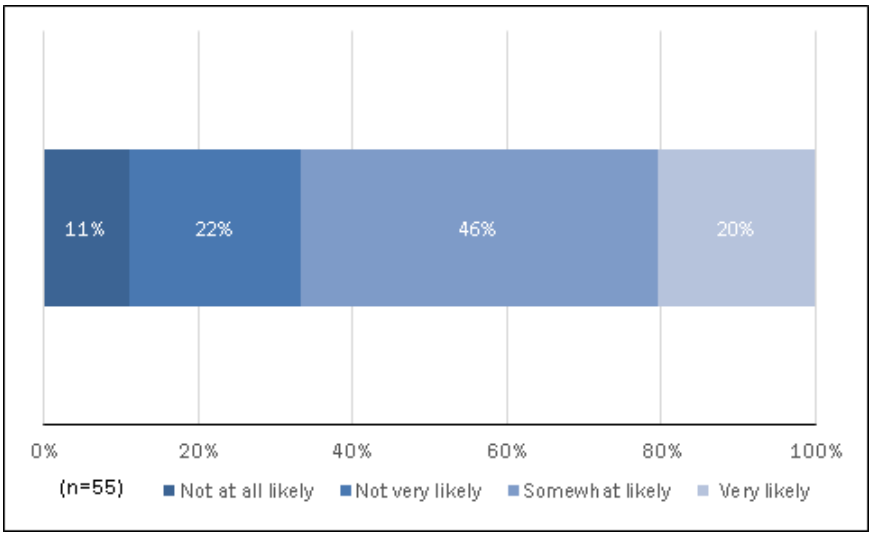
Table 24. Suggestions for Program Improvement (Multiple Response)

Suggestion	Percentage of Participants (n=153)
No recommendations	63%
Shorten/simplify application/paperwork/program in general	13%
Higher incentives	12%
More measures/equipment	4%
More incentives	4%
Key account executives provide more information	2%
Greater publicity	2%
Shorten approval process	1%
Easier to obtain program information/provide consistent information	1%
Other	6%

4.1.5 POTENTIAL ENGAGEMENT WITH NON-PARTICIPANTS

Overall, only a small percentage of non-participants familiar with the ActOnEnergy Business Program are highly likely to participate in the next year. Among those who are not likely to participate, the primary reasons cited are that they do not need any new equipment (33%), and that they do not believe that what they might need would qualify (22%). The latter comment may be a reflection of the fact that few non-participants have a good understanding of program details.

Figure 9. Likelihood of Participation within One Year among Non-Participants with Familiarity of ActOnEnergy



Note: Values are displayed as valid percents (i.e., the "Don't Knows" and refusals have been removed).

Market Trends and Equipment Purchases

In order to further understand the potential for participation among non-participants, the team asked a series of questions about current practices and decision-making criteria used by these customers.

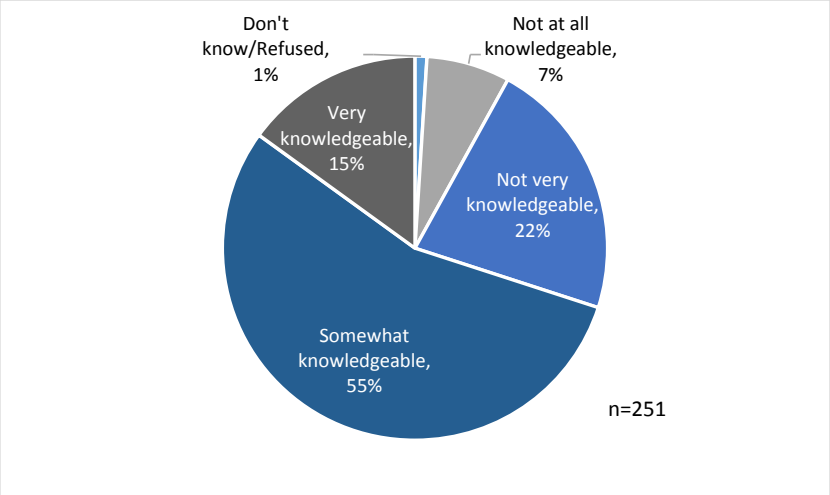
Efficiency of Existing Equipment

In general, the majority of respondents feel they have some knowledge of different ways their company can save money by using energy more efficiently (70%). However, only a small percentage (15%) believe they are very knowledgeable. In general, those with some perceived knowledge consider their facilities to be at least somewhat efficient. More specifically, among respondents that are somewhat or very knowledgeable about ways to save money through energy efficiency, slightly more than half (52%) believe their facility is somewhat efficient, with another 42% believing their facility is very efficient, and 5% rating their facility as not efficient. This poses a potential challenge to the program, as customers that feel they have knowledge and an efficient facility likely will not feel the impetus to take further action through the program.

The non-participant survey also revealed that perceived facility efficiency is not based on information provided through audits. For example, only 4% of respondents indicate they have had an energy audit or consultation to assess their facility's energy efficiency. Despite the low frequency of audits among business customers, as mentioned above, almost three-quarters of non-

participants (70%) consider themselves very or somewhat knowledgeable of different ways they can save money by using energy more efficiently.

Figure 10. Perceived Knowledge of Ways to Save Money by Using Energy More Efficiently

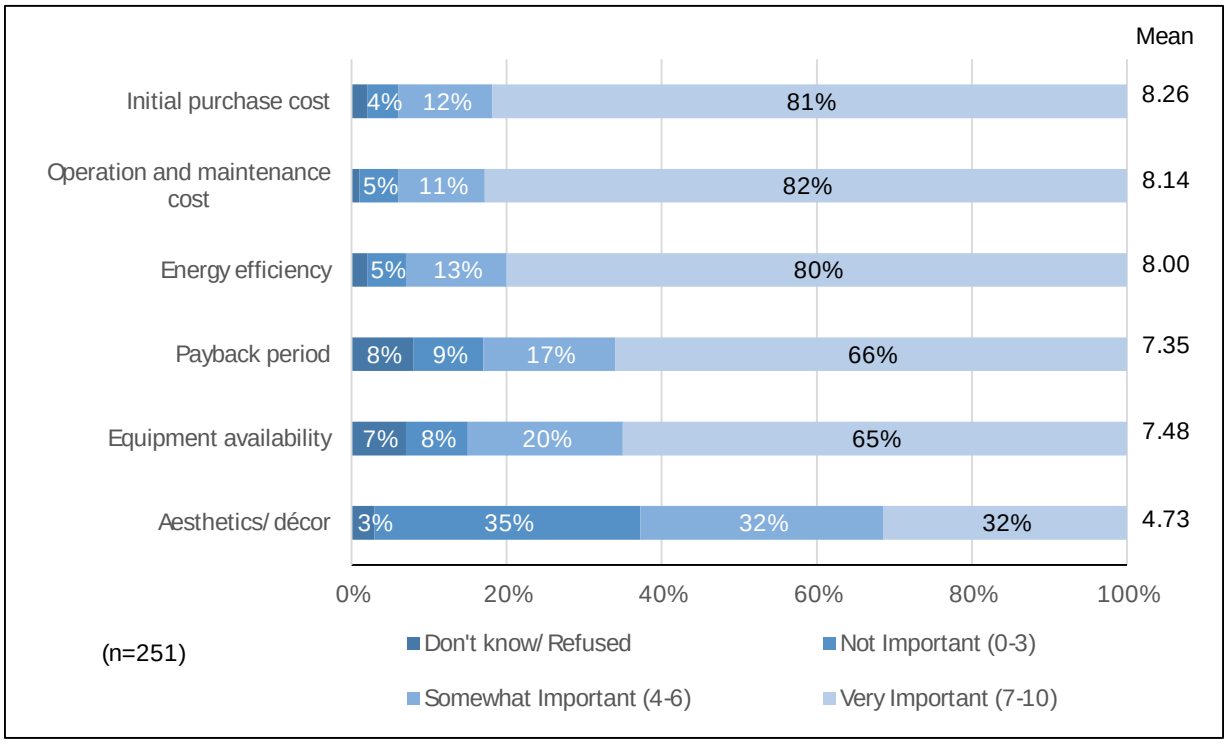


These findings further illustrate potential barriers to participation among non-participants. In particular, customers' current views of efficiency may not be based on real data about their facility or an understanding of all of the options available to them.

Decision-Making

When considering the purchase of new equipment, non-participants rank the initial purchase cost, operation and maintenance costs, and energy efficiency as top concerns (mean scores of 8.26, 8.14, and 8.00, respectively, on a 10-point scale where 0 is "not at all important" and 10 is "very important"). Self-categorized small businesses rate energy efficiency as more important than other sized businesses do (mean score of 8.19 vs. 7.52 for medium and large businesses).

Figure 11. Importance of Factors in Purchase Decisions for Energy-Using Equipment



4.2 ONLINE STORE PROCESS FINDINGS

The evaluation team performed a targeted process evaluation of the Online Store offering, focusing mainly on the program experience and satisfaction. Results are based on in-depth interviews, a review of program data, and an Internet survey with participants.

Online Store Participants and Measures

Online Store participants are AIC customers who either purchased products through the ActOnEnergy Online Store or responded to a promotional offer for a free lighting kit. Here we refer to both as participants. The majority of Online Store savings continue to be driven by the free lighting kit offer, where customers could receive six CFLs or three CFLs and three LEDs for free. Some AIC customers received four CFLs and two LEDs as a result of a promotion at the end of PY4 that carried into PY5.

Table 25 below shows the number of units distributed or sold in PY5 compared to PY4. While the volume has decreased, the mix of products and their relative contribution to sales has remained relatively constant.

Table 25. Online Store Purchases (in Units) across Program Years

Product Type	PY4		PY5	
	Number of Units	Percent of Units	Number of Units	Percent of Units
Lighting Kits – Free	32,374	63.80%	14,740	50.06%
Spiral CFLs – Paid	10,092	19.90%	6,692	22.73%
LED Lights – Paid	905	1.80%	2,859	9.71%
T8 Ballasts	2,588	5.10%	1,760	5.98%
Specialty CFLs	2,443	4.80%	1,445	4.91%
LED Exit Signs	1,457	2.90%	1,198	4.07%
Motion Sensors	545	1.10%	456	1.55%
LED Exit Sign Retrofit Kits	202	0.40%	118	0.40%
Vending Controls	66	0.10%	65	0.22%
T8 Lamps	29	0.10%	98	0.33%
LED Downlights	10	0.00%	12	0.04%
Total	**50,711**	**100%**	**29,443**	**100%**

Online Store Participants

During PY5, AIC made a number of changes to how customers could take advantage of the Online Store. Previously, customers could only respond to the free lighting kit offer by returning a postcard or visiting the Online Store website. In PY5, they could also respond by phone, and the program tracked the channel through which people responded.

The promotional offer for a free lighting kit continues to be the key driver of program participation. As shown in Table 26 below, over three-quarters of participants (80%) solely applied for the lighting kit, and only a small minority of all participants (4%) went on to purchase additional products through the Online Store.

Table 26. Online Store Program Participation

Program Participation	Percentage (n=396)
Received free lighting kit only	80%
Purchased through Online Store only	16%
Received free lighting kit and purchased through Online Store	4%

As shown in Table 27 below, notable participant characteristics include that two-thirds of participants identify themselves as a small company; almost three-quarters (74%) of all participants own their facility; and the majority of participants are responsible for paying their electric and gas bills. Further, the team found no distinct differences between those companies that requested a lighting kit and those that utilized the Online Store directly.

Table 27. Self-Reported Company Characteristics

Characteristics	Percentage (n=396)
Company Size	
A small company	67%
A medium-sized company	18%
A large company	5%
Ownership of Facility	
Company owns facility	74%
Company rents facility	12%
Utility Bills	
Company pays electric bill	92%
Company pays gas bill	77%

Program Design and Implementation

As in prior years, the program offered a free lighting kit through the Online Store. In particular, customers had the choice of a kit containing six CFL bulbs or a kit with three CFLs and three LED bulbs.[12] The program allowed customers to respond to this offer in a number of different ways—direct mail card return, Online Store response, and calling the program's 800 number—and the use of the free lighting kits was extremely effective in achieving electric savings.

The program also launched a special holiday offer for AIC customers interested in the L Prize (Bright Tomorrow Lighting Prize) bulb.[13] As part of this effort customers could purchase these bulbs at a discounted price, and if they purchased a certain number of bulbs, the program would make a donation to either the non-profits of St. Jude or Wounded Warrior.

Data Tracking

As in prior years, SAIC tracks Online Store orders outside of the AIB database using an Excel-based spreadsheet to summarize monthly invoice files from EFI, which hosts the Online Store. Though this method has proven to be highly accurate at the program level, the team did find a number of discrepancies between the spreadsheet and the source files. In addition, some products were not listed in the spreadsheet at all. To aid in future evaluation efforts and in the program's own tracking, we recommend importing and analyzing this data in AIB or its successor.

[12] A number of kits with four CFLs and two LEDs were also provided during PY5. However, these kits were a legacy offer from PY4.

[13] The prize is awarded by the US Department of Energy to manufacturers that produce high-quality and high-efficiency light bulbs to replace incandescents.

Online Store Awareness

Table 28 below shows how participants who visited the Online Store first learned about it. The most common channels include bill inserts or mailings (28%), followed by emails from AIC (26%). When asked about best ways to reach companies for future Online Store offerings, the vast majority (72%) identify email as the preferred form of communication. While print materials played an important role in advertising the initial program, only one-third of the respondents (35%) prefer to receive new information via direct mail, and only 10% through bill inserts.

Table 28. How Participants First Learn about the Online Store among Those Who Made a Purchase (Multiple Response)

Source of Information	Percentage (n=164)
Bill insert/mailing	28%
Email	26%
Flyer/mailer (not from AIC)	16%
Website/online ad	10%
Coupon/information included with CFLs	7%
Other ActOnEnergy contact (auditor, incentive, etc.)	5%
Seminar/conference	5%
AIC (other)	3%
Other	4%

Participation Process

Lighting Kit Experience

In general, AIC and EFI appear to administer the lighting kit portion of this program offering effectively. The majority of respondents (91%) found the process of requesting the lighting kit easy (rating of 9 or 10 on a 10-point scale). Most respondents were also satisfied with the delivery time (mean score 8.9 on a 10-point scale), which averaged three weeks and is shown in more detail in Table 29.

Table 29. Delivery Time for Lighting Kits

Time to Receive Free Kit	Percentage (n=238)*
1 week	5%
2 weeks	34%
3 weeks	26%
4 weeks	26%
5 weeks or more	7%

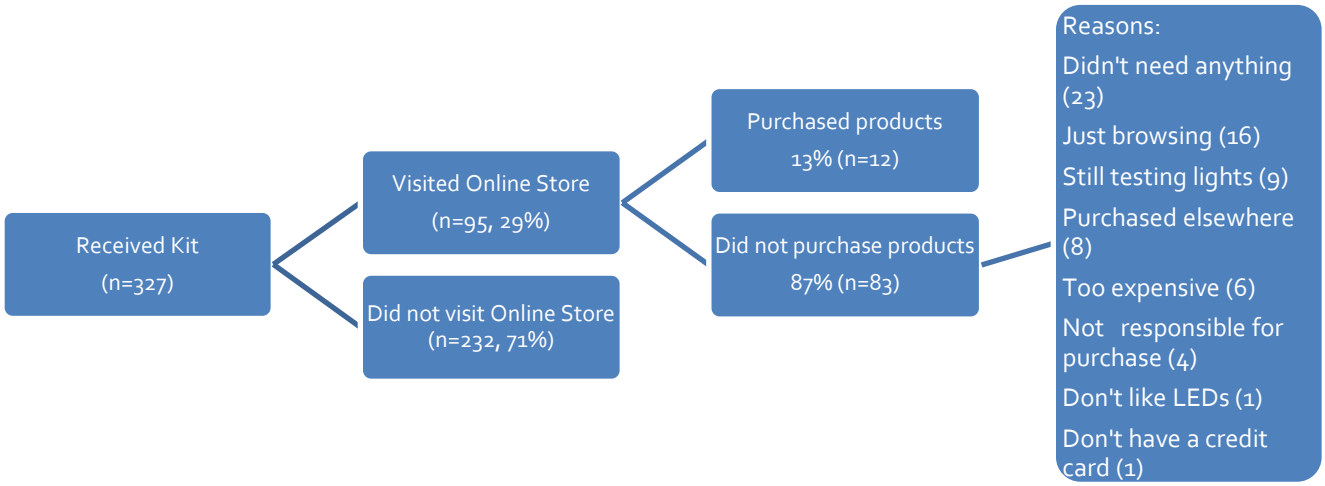
*Note: The base of 238 respondents omits 86 respondents who could not remember the delivery time.

However, there may be greater opportunities to leverage the kit experience to draw customers into the Online Store. At present, the kit experience and associated Online Store exposure have not

fostered greater levels of participation in the Online Store more generally. For example, while more than one-quarter of all lighting kit recipients (29%) visited the Online Store, a small minority of companies who received the lighting kit (4%)[14] went on to purchase products through it.

Examining the responses of those participants who did not purchase items from the Online Store reveals the potential for future sales: over one-quarter of these respondents stated they simply did not require lighting products at the time of the visit, whereas others said they were "just browsing" (19%) or still testing new lights (10%). A smaller group of participants is less likely to purchase from the Online Store in the future, as they stated that they purchase products elsewhere (9%) or said that the Online Store was too expensive (7%).

Figure 12. Kit Recipient Purchase Behavior



Lighting Kit Selection

As part of the PY5 evaluation, the team sought to understand how participants select different lighting kits available through the program. During the program year, AIC customers had the choice of CFL-only kits and combination kits with both CFLs and LEDs.

Among PY5 Online Store customers who requested and received a free lighting kit, over half (54%) chose the lighting kit containing three CFL bulbs and three LED bulbs, while just under half (46%) received the kit with six CFLs only.[15] The key drivers for choosing the combination package was experimenting and comparing the two bulb types (37%), specifically trying LED lighting (28%), and 22% of the respondents stated they already knew and preferred LED lighting due to energy savings, better quality, and longer lifetime (see Table 30 below).

Table 30. Reason for Choosing Three-CFL and Three-LED Package

Reason	Percentage (n=199)
I wanted to try both for comparison	37%

[14] This figure is based on our review of program-tracking records.

[15] The survey also included questions about the 4CFL/2LED kit, though this was a legacy promotion (though some were shipped in PY5, the purchases were made in PY4).

Reason	Percentage (n=199)
I wanted to try LEDs specifically	28%
I prefer LEDs	22%
I need or use both CFLs and LEDs	15%
I wanted both for better variety	6%
No particular reason	3%
Other	6%
Don't know	2%

As shown in Table 31 below, respondents who chose the six-CFL package over the three-LED, three-CFL kit generally appear not to understand LED technology and how it compares to CFLs. For example, responses related to a facility using more CFLs (28%) and not needing LEDs (14%) indicate a lack of understanding as to how LEDs can be used and their ability to replace CFLs. It is also possible that those who expressed preferences with respect to CFL light color and sizing (29%) have not seen LEDs installed and therefore do not know how their light compares.

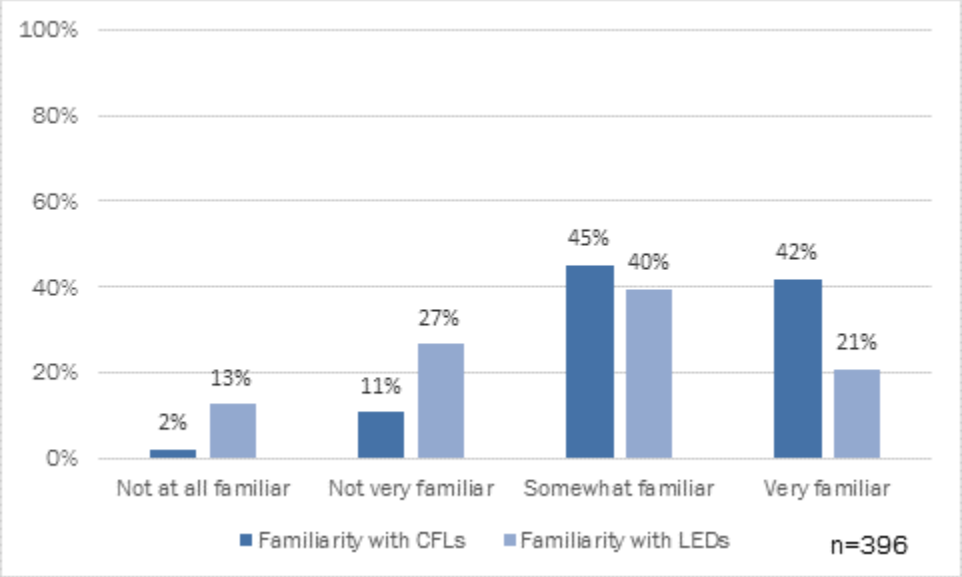
Table 31. Reasons for Choosing Six-CFL Package

Reason	Percent (n=115)
Prefer CFLs (better light, brighter, better size)	29%
My facility uses more CFLs	28%
I am less familiar with LED	16%
I did not need LED bulbs	14%
I don't like LED bulbs	5%
Was not aware of the other package	5%
Other	12%

Participant Familiarity with CFL and LED Lighting

The team provided an image as well as a description of LEDs and CFLs, and then asked respondents about their familiarity with these bulbs prior to taking the survey. As shown in Figure 13 below, in general participants are more familiar with CFLs than LEDs.

Figure 13. Participant Familiarity with LEDs and CFLs



We then asked respondents how likely they would be to purchase an LED in the next year based on what they now knew about the bulbs. In general, most respondents are likely to purchase a bulb. In particular, more than half of the respondents (54%) state that they are "very likely" to install LED bulbs within next year, while an additional 40% are "somewhat likely." Those respondents who were "not very likely" to install LED bulbs identified high costs (26%), no need (20%), and discomfort with the light from LEDs (16%) as the main reasons why they don't plan to invest in the bulbs during the next year (see Table 32). Note that some respondents may purchase bulbs depending on the price.

Table 32. Reasons for Not Purchasing LED Bulbs among Those Not Very Likely to Purchase in the Next Year (Multiple Response)

Reason	Percent (n=181)
Too expensive/high upfront costs	26%
Don't need any	20%
Don't like LEDs or the light from LEDs	16%
Prefer incandescent lighting or CFLs	10%
Use other light fixture/cannot install LEDs	7%
Premature burnout experience	2%
Not responsible for lighting in my company	1%
Will purchase depending on price	10%
Other	4%
Don't know	7%

Online Store Experience

The Online Store serves as a source of new information for AIC customers, and allows them to access data on available energy-efficient products. In PY5, customers experienced the Online Store

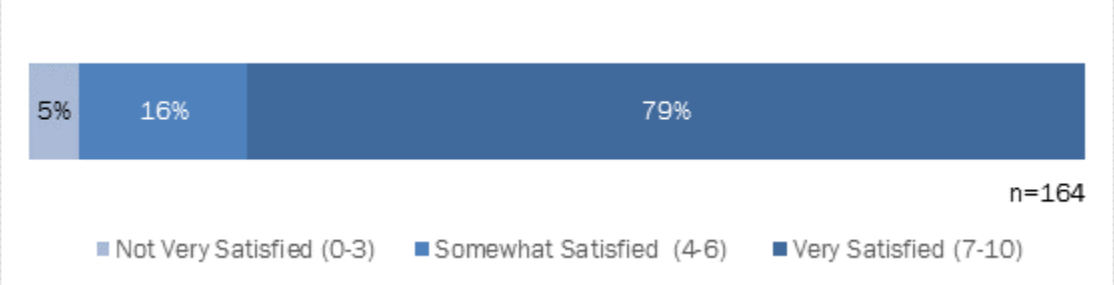
in a number of ways: visiting the website only (n=83), purchasing products through the store (n=69) and receiving a kit, as well as making a purchase through the store (n=12). This section describes the impression that these individuals had of the Online Store.

Product Information and Selection

The majority of participants who visited the Online Store (88%) stated that the amount of information displayed on the Online Store website is "just the right amount," whereas 10% of the participants would prefer more information. The latter identified the following as missing from the website: more detailed manufacturing or product information (47%), different sizing of bulbs (12%), and a larger product selection in general (12%).

Satisfaction ratings for the product selection available through the Online Store are summarized in Figure 14 below. As shown, more than half of participants (79%) are satisfied, resulting in a mean satisfaction rating of 8.0 on a 10-point scale where 0 is "Very Dissatisfied" and 10 is "Very Satisfied."

Figure 14. Participant Satisfaction with Online Store Product Selection



We asked those respondents who provided a satisfaction rating of less than 5 what products they would like to see offered through the Online Store. About half of these 11 respondents (6/11) identified more bulbs and fixtures, whereas individuals further recommended emergency lighting and all-weather lighting.

Purchase Experience

Overall, one-fifth of respondents purchased products offered through the Online Store. The average delivery time was two weeks, and Table 33 below shows that most participants (96%) received their order within three weeks of purchase. Further, return rates are low at 1%. In general, shipment times are slightly faster for Online Store purchases compared to the free lighting kits. This may be the result of additional processing required for those who request the kits by mail or phone, and therefore do not have an existing verified online account.

Table 33. Online Store Delivery Times

Delivery Time	Percentage (n=56)*
1 week	30%
2 weeks	50%
3 weeks	16%
4 weeks	2%
5 weeks	2%

*Note: The base of 56 respondents omits 25 respondents who could not remember the delivery time.

Usability and Website Features

Overall, customers find the Online Store easy to use. Table 34 shows that participant's rate the user friendliness of the Online Store highly, with mean scores of 8.3 or above on a 10-point scale. As a result, only 3% of all Online Store visitors sought assistance via email, and 6% via phone.

Table 34. Participant Ratings of Website Usability

How easy or difficult was ...	Mean Score
Making payments for the products you purchased (n=67)	8.9
Getting to the Online Store landing page (n=154)	8.8
Navigating the Online Store website (n=157)	8.8
Finding the products that interested you (n=156)	8.6
Getting the information that you were looking for (n=156)	8.5
Creating an Online Store account (n=70)	8.3

Note: Scale from 0 to 10, where 0 is "Very difficult" and 10 is "Very easy."

Similarly, the majority of participants find the website's existing features helpful. Only 6% of Online Store visitors identified missing features or functionalities, such as more-detailed product descriptions (n=3), a larger product selection (n=3), more background information contrasting CFL and LED versus incandescent lighting (n=2), and a drop-down box for product descriptions (n=1).

Table 35. Participants Rating of Online Store Features

How helpful did you find ...	Mean Score
Detailed product descriptions (n=164)	8.6
Search function (n=164)	8.3
Package tracking (n=81)	7.9

Note: Scale from 0 to 10, where 0 is "Not at all helpful" and 10 is "Very helpful."

Customer Satisfaction

Customer satisfaction with aspects of the Online Store offering as well as with AIC is high, with mean scores of 8 and above on a 10-point scale.

Table 36. Participant Satisfaction Ratings

Satisfaction with... [a]	Mean Score
The overall experience using the Online Store (n=150)	8.8
Ameren Illinois Company (n=161)	8.8
The amount of time it took to ship the purchased products (n=77)	8.4
The support provided to you by the Online Store staff (n=13)	8.2
The product selection (n=164)	8.0

Note: Scale from 0 to 10, where 0 is "Very dissatisfied" and 10 is "Very satisfied."

[a] The team reached a single respondent who returned products purchased through the Online Store. That respondent provided a satisfaction rating of 9.0 for the return process.

Table 37 below shows participants' agreement with statements about the Online Store. Notably, almost half (45%) of all website visitors strongly agreed that the store made it easy to obtain products (giving a rating of 10). Also, one-fifth of the respondents (21%) strongly agreed that the website provided information they did not know before.

Table 37. Participant Perceptions of Online Store Benefits

The AIC ActOnEnergy Online Store ...	Mean Score
Made it very easy to obtain a product	8.7
Is a valuable tool for researching and purchasing energy-efficient products	8.4
Exposed me to energy-saving products that I otherwise would not have known about	7.7
Provided me with information that I did not know before	7.3

Note: Scale from 0 to 10, where 0 is "Strongly disagree" and 10 is "Strongly agree."

Future Online Store Participation

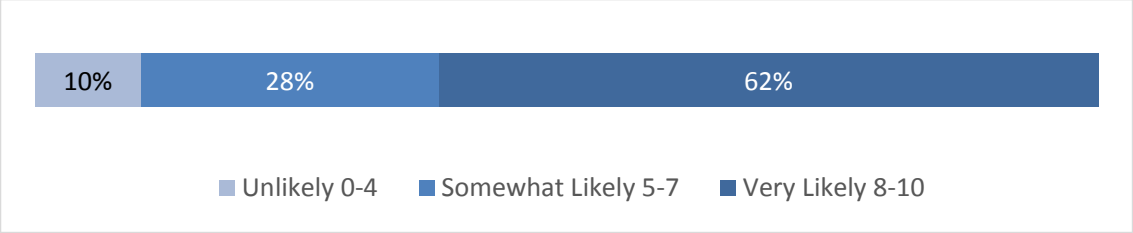
Twelve percent (12%) of respondents purchased multiple products through the Online Store. The key driver of repeated purchases is promotional offers from the store, as shown in Table 38 below. This illustrates the effectiveness of AIC and SAIC efforts to use promotions as a way to generate participation in the Online Store offering.

Table 38. Motivation to Return to the Online Store among Those Who Made Multiple Purchases (Mulitple Response)

Motivation	Percentage (n=48)
An Online Store promotion offering discounts on select products	73%
A need for additional products	63%
Your experience with the products you already purchased	52%

When asked about the likelihood of making additional purchases in the coming year, 62% of all website visitors give a rating between 8 and 10 on a 10-point scale (where 10 is "Extremely likely"), as shown in Figure 15.

Figure 15. Participant Likelihood to Purchase through the Online Store Next Year



Note: Scale from 0 to 10, where 0 is "Strongly disagree" and 10 is "Strongly agree."

Online Store Channeling

Table 39 below shows that over half of all program participants (58%) are aware that AIC offers incentives to its business customers for energy-efficient equipment upgrades and improvements. Among those aware of AIC's offerings, one-fifth (21%) have already applied for incentives to fund

predominantly lighting (28%), and in some cases heating (4%) or air conditioning (2%) upgrades. Half of these individuals (10% of program participants) further stated that their decision was influenced by the Online Store through the availability of low prices, as well as increased awareness of energy-saving appliances and program incentives.

Table 39. Awareness of and Participation in the AIC ActOnEnergy Business Program

Awareness	Percentage
Aware of incentives (n=396)	58%
Applied for incentives in the past (n=228)	21%
Influenced by Online Store to apply for incentives (n=228)	10%

When asked about the likelihood of future program participation, the majority of respondents see themselves involved in the program, as shown in Figure 16.

Figure 16. Likelihood of ActOnEnergy Program Participation in the Next Year (n=228)

To identify potential barriers to program participation, the team asked respondents who were aware of AIC business programs why they had not applied for incentives through the other AIC programs. The main reasons included not needing upgrades at their facility, not having time to make upgrades, or the perception that their desired upgrades do not qualify. Although mentioned by fewer respondents, the lack of awareness of incentive offerings and the perception that the effort to apply was not worth it demonstrate the need for additional outreach to customers about the ActOnEnergy programs. Program staff may want to consider including program materials in the product packages mailed to participants.

Table 40. Reasons for Non-Participation in Other ActOnEnergy Business Programs among Those Aware of Them

Reasons for Non-Participation	Percentage (n=181)
No upgrades needed	19%
Didn't have time	13%
Upgrades didn't qualify	12%
Was not aware of incentives	8%
Small business/not worth it	6%
No reason in particular	6%
Cost too high	6%
Programs too complicated/too much paperwork	3%
Don't own the building	2%
Other	7%

4.3 IMPACT RESULTS

4.3.1 GROSS IMPACTS

Overall, total gross energy and demand impacts for the PY5 C&I Standard Program are 16,867 MW, 122,882 MWh, and 2,062,981 therms. The following sections outline the verification and analysis activities performed for each program component.

Core Standard Program

A total of 1,297 projects were completed through the Core Program in PY5, and the team was able to verify that all of them were implemented based on a review of program-tracking data, as well as site visits. As in the past, the overwhelming majority were lighting projects, followed by HVAC projects.

Table 41. Core Standard Program Verification Results

Measure Type	Program-Tracking Measure Count[a]	Verified Measure Count	Verification Rate
Lighting	2,685	2,685	1.00
HVAC	470	470	1.00
Motor	92	92	1.00
Refrigeration	126	126	1.00
Agriculture	3	3	1.00
Water Heater	19	19	1.00
Steam Trap	90	90	1.00
Kitchen	3	3	1.00
Leak Repair	15	15	1.00
Total	**3,503**	**3,503**	

[a] Please note that the number presented here is a count of the project IDs and associated measures within each of these categories, as opposed to the number of units per measure or measure quantity.

Similarly, our impact analysis activities for the Standard Program yielded *ex post* gross electric and gas energy savings, and peak kW impacts that are approximately equal to *ex ante* estimates (i.e., high gross realization rates).

Table 42. Standard Core Gross Impacts

Project Type	Verified Measures	*Ex Ante* Gross			*Ex Post* Gross			Realization Rate		
		kW	MWh	Therm	kW	MWh	Therm	kW	MWh	Therm
Lighting	2,685	9,776	56,295	–	9,789	56,334	–	1.00	1.00	–
HVAC	470	738	6,636	94,129	738	6,931	94,129	1.00	1.04	1.00
Motor	92	4,664	27,569	–	4,664	27,569	–	1.00	1.00	–
Specialty	151	985	2,948	3,604	985	2,948	3,604	1.00	1.00	1.00
Steam Trap	90	–	–	1,942,326	–	–	1,942,326	–	–	1.00
Leak Survey & Repair	15	655	5,296	–	557	4,792	–	0.85	0.90	–
Total	**3,503**	**16,819**	**98,744**	**2,040,058**	**16,733**	**98,573**	**2,040,058**	**0.99**	**1.00**	**1.00**

Two types of gross impact adjustments were made at the measure level to projects in the telephone survey sample: 1) survey-based adjustments, and 2) engineering review adjustments.

Survey-based adjustments were made after analyzing answers provided by telephone respondents to two types of questions: 1) questions on whether installations were installed as described (a quantity adjustment), and 2) questions on whether the measure claimed was compliant with baseline and eligibility requirements for assignment of a deemed value drawn from the Illinois TRM. Responses that indicated a potential adjustment were reviewed on a measure-by-measure basis, consulting documentation records in AIB, and contacting participants if necessary.

Overall, there were no instances of adjustments based on asking whether a measure was installed as described. There were also no instances of measures determined to be ineligible, and no responses that resulted in an adjustment for inappropriate baselines. Five respondents answered "Yes" to question L4: "After you completed the installation of the new fixtures, did you install additional lighting fixtures in that same space at a later time to increase the amount of lighting?" The number of fixtures added were four, six, 10, and "Don't Know" (i.e., 24 fixtures out of 423 under consideration in the five projects, and over 10,000 fixtures covered in the lighting sample).

The initial telephone interview did not identify why fixtures were added to increase lighting levels in the space—whether it was due to inadequate lighting in the rebated project, a change in space usage after the project was complete, or user discretion unrelated to the program. The team concluded that no quantity adjustments should be made as a result of the telephone interview responses without a follow-up call or site visit to learn why fixtures were added. The potential impact on program savings from additional fixtures was negligible. If adding fixtures were a frequent occurrence or substantial numbers were seen, the situation would merit follow-up. No evaluation adjustments were made to *ex ante* gross savings based on responses to questions on non-lighting measures.

One survey question (Lighting Question L10) led to adjustments to *ex post* savings. Adjustments were made to five lighting projects due to respondents indicating the described lighting measures were installed in cooled or uncooled space—where answers were the opposite of assumptions used for *ex ante* claimed savings. The Illinois TRM provides substantial demand and energy savings credit for cooling system waste heat interaction factors. At the measure level, respondents were asked if the lighting was installed in a cooled space—and could respond Yes, No, Some Was/Some Wasn't, Refused or Don't Know. Only Yes or No responses were considered for *ex post* adjustments. If a conflict between the respondent and tracking data arose, AIB documents were examined to determine whether the respondent's answer should be accepted or rejected. In some cases, these differences arose in projects that had partially cooled facilities, or the scope had changed between initial and final retrofit. Table 43 summarizes the findings for projects that were adjusted.

Table 43. Standard Core Gross Impacts Adjusted Based on Individual Responses

Project	Impact on Savings (Increase vs. Decrease)	kWh Change	Explanation
Project 500793	↓	5,229	Measure BPL91 was installed in an uncooled space ,while AIB indicated it was cooled
Project 500828	↑	5,255	Interior lighting measures were installed in a cooled space, while AIB indicated it was uncooled
Project 500935	↑	7,214	Measures were installed in a cooled space, while AIB indicated it was uncooled
Project 501427	↓	64	Measure BPL62 was installed in an uncooled space, while AIB indicated it was cooled
Project 501807	↓	37	Measure BPL91 was installed in an uncooled space, while AIB indicated it was cooled
Total	↑	**7,139**	

AIB records the application checkbox data for whether the project space is cooled or uncooled, and tracks cooled/uncooled at the measure level. As a general observation, nearly all surveyed tracking entries matched participant responses, and those few that did not, did not show a bias. As a result, there is no recommendation for changing program implementation procedures.

The engineering review of measures examined two issues: 1) whether the deemed values from the Illinois TRM (Version 1.0) were correctly implemented in the tracking system for *ex ante* gross savings, and 2) for measures that did not have deemed values, whether savings in sampled projects were estimated correctly. The review approach is described below.

Projects with Illinois TRM deemed savings measures were checked against supporting documentation from the implementer outlining their translation of the TRM to ActOnEnergy Business Program measures. The supporting documentation was provided to the evaluation team as a set of spreadsheets covering Standard Program end-uses, with one tab per AOE measure. The spreadsheets reproduced the TRM algorithms and inputs used to generate per-unit savings values. The first step in the review process confirmed that each TRM spreadsheet was complete and correct in the estimation of measure savings. The spreadsheets were easy to follow, and no errors were identified. The second review step confirmed that the TRM values were used properly in the tracking system to report *ex ante* savings. This check examined whether the unit savings in the tracking system matched the spreadsheet for the measure under review, based on parameter and custom input values such as building type, fixture wattages, equipment capacities, and baseline or operating characteristics.

All non-deemed measures in the sample received an engineering review. The *ex ante* savings estimate was adjusted if the project data or calculation approach was found to contain an error, or an unsupported assumption that was judged inconsistent with standard engineering practices and judgment. Several projects required more extensive follow-up with the project documentation in AIB and telephone calls to project parties to clarify aspects of the project, and two projects were adjusted.

The engineering review resulted in savings adjustments on the following projects:

- **Project 500736** – This was a deemed HVAC variable-frequency drive project, measure BPC20, involving a 75 HP motor for a fan in a medical facility. The *ex ante* gross energy savings were 34,460 kWh, which did not match the TRM calculation, although the demand savings did match the TRM. AIB documents were reviewed, and the energy savings were adjusted. *Ex post* gross energy savings were 73,487 kWh, an increase of 39,027 kWh.

- **Project 501659** – This was a non-deemed compressed air leak repair project. The project data indicated energy savings that were higher than estimated baseline compressed air usage—a savings of 137%. This outlier needed to be changed, but AIB documents were reviewed, and no documentation was found to refute an evaluation finding of overstated savings. Therefore, we looked elsewhere to determine an appropriate reduction. The savings methodology relies upon trade allies to estimate leak size, and repair of leaks is associated with a specified CFM reduction, based on a chart available from the US Department of Energy (US DOE).[16] The chart provides a reasonable estimate of CFM lost to leakage—assuming the leak size is correctly

[16] US Department of Energy, *Compressed Air Tip Sheet #3*, December 2000, Washington DC.

determined. The CFM reduction from leak repair was converted to energy savings using a reasonable conversion ratio. In project 501659, the overstated savings appears to have been caused by the vendor overestimating the size of the largest leaks, which dominate the savings calculation. We determined the savings should be adjusted downward. However, we did not have the information to make a project-specific *ex post* estimate. Instead, we followed the approach taken with process VFDs and chose an upper limit to claimed savings. The US DOE compressed air tip sheet states that "Leaks are a significant source of wasted energy in a compressed air system, often wasting as much as 20-30% of the compressor's output." Excluding project 501659, the Leak Repair Program had an average calculated energy savings of 15% for 15 projects, which is reasonable. The largest savings claimed was 41%. The *ex post* savings for project 501659 were limited to 41% savings. As a result, the *ex post* gross energy savings were 34,358 kWh, compared with 114,554 *ex ante* kWh, a decrease of 80,197 kWh.

Online Store

We verified program participation by examining the Online Store product data for product eligibility and time of sale or disbursement. Our review of the program-tracking data found that all products were provided to customers during the eligible time period. We also examined the program-tracking data to ensure that the appropriate TRM algorithm was used to calculate program savings for each product. For lighting measures, this included a check that the correct base wattage was used to calculate savings.

Table 44 below shows the tracked and verified quantity of measures sold or provided free of charge through the Online Store. As in prior years, the free lighting kits continue to account for the greatest percentage of measures provided to AIC customers through the Online Store. It is important to note that starting in PY5, the Statewide TRM provides an installation rate of 1.0 for CFLs if a customer agrees to install them within a given timeframe. AIC and SAIC modified their outreach to customers regarding the lighting kits to ensure that a commitment was made. As a result, the verification rate for all of the free lighting measures is 1.0.[17]

[17] The team gathered information about measure installation as part of the participant survey. Findings from that analysis are provided in the Input for Future Planning section of the report.

Table 44. Online Store Verification Results

Measure Type	Program Tracking No. of Units	Verified No. of Units	Verification Rate
Three-CFL and Three-LED Kits	7,177	7,177	100%
Total CFL Bulbs	*21,531*	*21,531*	–
Total LED Bulbs	*21,531*	*21,531*	–
Four-CFL and Two-LED Kits	1,564	1,564	100%
Total CFL Bulbs	*6,256*	*6,256*	–
Total LED Bulbs	*3,128*	*3,128*	–
Six-CFL Kits	5,999	5,999	100%
Spiral CFL	6,688	6,692	100%
LED Lights	3,173	2,859	90%
T8 Ballast	1,760	1,760	100%
Specialty CFL	1,449	1,445	100%
LED Exit Sign	1,199	1,198	100%
Motion Sensor	455	456	100%
LED Exit Sign Light Bulbs	118	118	100%
T8 Lamp	50	98	196%
Vending Control	65	65	100%
LED Downlight	24	12	50%
Total (Including All Kit Measures)	**73,426**	**73,148**	**100%**

Table 45 below presents the verified Online Store gross impacts. These calculations occurred in two stages. The first was based on verified participation and TRM-based energy savings calculations. The second is the addition of carryover savings from PY4. Because some bulbs purchased in PY4 were put in storage for later installation, an installation adjustment factor was required to calculate the gross savings achieved in PY5. This calculation was performed as part of the PY4 evaluation effort.[18]

Due to changes in program implementation, this approach is not used for bulbs distributed in PY5. This is due to the fact that customers made commitments to install all kit items at the AIC service address associated with the account within 60 days of receipt. Based on the Statewide TRM, in cases where customers commit to install measures, AIC and its implementers can assume an installation rate of 1.0.

[18] We used the 2012 Statewide TRM method that banks savings from PY4 sales for application in future years.

Table 45. Online Store Gross Impacts

Measure Group	Verified Participation	*Ex Ante* Gross Impacts (MWh)	*Ex Post* Gross Impacts (MWh)	Realization Rate
Free Lighting Kits – CFLs	8,741	9,956	5,013	86%
Free Lighting Kits – LEDs	8,741		3,561	
Free CFLs (Six-Packs)	5,999	8,261	7,000	85%
Non-Free CFLs, LED Exit Signs, and LED Exit Sign Retrofit Kits	9,454	1,870	1,774	95%
Other Products	2,330	1,738	1,672	96%
PY5 Total Without Carryover	**35,265**	**21,825**	**19,019**	**87%**
PY4 Carryover Savings		**5,290**	**5,290**	
PY5 Overall Total		**27,115**	**24,309**	**90%**

Note: Realization Rate = *Ex Post* Value / *Ex Ante* Value.

Ex post gross savings are different than *ex ante* gross savings due to several methodological reasons:

- Lighting Kits: The evaluation team used data available in program-tracking records to calculate *ex post* savings for these measures. In those cases, where business type information was provided, we used that data to calculate savings. In instances where it was not available (94%), we applied the hours of use (HOU) associated with miscellaneous business types. This had an impact on all of the kits distributed in PY5.
  - Six-CFL Kit: After calculating savings using the available business type data provided in the kit-request records, the *ex post* per-kit savings value (1,167 kWh) is lower than the *ex ante* per-kit value that AIC used to calculate savings (1,377 kWh).
  - Three-CFL and Three-LED Kit: After calculating kit savings using the available business type data provided in the kit-request records, the *ex post* per-kit savings value (953 kWh) is lower than the value AIC used for *ex ante* savings (1,124 kWh). However, this is very close to the per-kit savings value for a "Miscellaneous" business type (952 kWh).
  - Four-CFL and Two-LED Kit: Business type data was unavailable for the 4CFL/2LED kits. In their *ex ante* calculations, AIC used a business type distribution developed based on an EFI telephone survey. Given that the evaluation team did not have access to that data, we assigned these records to the "Miscellaneous" business type.
- LED Downlights: The difference between *ex ante* and *ex post* gross savings for this measure category is primarily due to a difference in verification. The number of LED downlights listed in the EFI invoice files is less than the number tallied by SAIC in their summary of the data.
- LED Lights: The difference between *ex ante* and *ex post* gross savings in this measure category is primarily due to a difference in verification. The number of LED lights listed in the EFI invoice files is less than the number tallied by SAIC in their summary of the date.

- T8 Lamps: AIC does not claim savings for T8 lamps. This is because any savings due to T8 lamps are assumed to also be represented in the savings values for T8 ballasts.

Green Nozzles

The team verified program participation for Green Nozzles by examining the program-tracking data for customer eligibility and to ensure that the measures were all provided within the program year. Our review found that all green nozzles were provided to customers during the eligible time period.

Table 46. Green Nozzle Verification Results

Measure	Fuel Type	Program Total (N)	Verified Units	Verification Rate
Green Nozzle	Gas	88	88	100%
	Electric	22	22	100%
	Total	110	110	100%

We calculated gross impacts based on the Statewide TRM. As part of this process, we reviewed and applied the algorithm for this measure and found that the *ex ante* calculations were correct in all cases.

Table 47. Green Nozzle Verified Per-Unit Savings

Business Type	Tracked Per-Unit			Verified Per-Unit		
	kWh	kW	Therms	kWh	kW	Therms
Small, Quick Service Restaurants	1,385	N/A	61	1,385	N/A	61
Medium, Casual Dining Restaurants	4,154	N/A	183	4,154	N/A	183
Large, Institutional with Cafeteria	8,309	N/A	367	8,309	N/A	367

Note: The Illinois TRM does not account for peak savings for this measure.

Using these per-unit savings estimates, the team calculated energy savings for all 110 of the verified measures. The results, which are equal to *ex ante* estimates, are presented in Table 48 below.

Table 48. PY5 Green Nozzle Gross Savings

Program Component	*Ex Ante* Gross			*Ex Post* Gross			Realization Rate	
	kW	kWh	Therms	kW	kWh	Therms	kWh	Therms
Green Nozzle	N/A	134,325	22,923	N/A	134,325	22,923	100%	100%

SBDI Pilot

The team did not conduct impact analysis for the pilot effort in PY5. As a result, ex ante impacts are equal to ex post as illustrated in the following table containing energy impacts for the program.

Table 49. PY5 SBDI Pilot Gross Savings

Program Component	*Ex Ante* Gross			*Ex Post* Gross			Realization Rate
	kW	kWh	Therms	kW	kWh	Therms	kWh
SBDI	–	603,708	–	–	603,708	–	1.00

4.3.2 NET IMPACTS

In determining the overall net savings associated with the Standard Program, the team calculated net savings by project based on either the PY3 electric NTGRs, the PY5 gas planning values, or the PY5 staffing grant NTGR where applicable. As shown in Table 49 below, the Standard Program's overall net realization rate is 98% for electric energy, 100% for demand, and 100% for therms.

Table 50. Standard Program Net Impacts

Program Component	Ex Ante Net			Ex Ante NTGR (MWh/Therm)	Ex Post NTGR (MWh/Therm)	Ex Post Net		
	MW	MWh	Therms			MW	MWh	Therms
Core Program	13	75,261	2,040,058	0.76/1.00	0.76/1.00	13	75,130	2,040,058
Online Store	–	18,710 [a]	–	0.64	0.69[b]	–	16,773	–
Green Nozzle	–	110	22,923	0.82/1.00	0.82/1.00	–	110	22,923
SBDI Pilot	–	483	–	0.80	0.80	–	483	–
Total	13	94,564	2,062,981			13	92,498	2,062,981
Net Realization Rate						1.00	0.98	1.00

Note: Realization Rate = *Ex Post* Net Value / *Ex Ante* Net Value

[a] This value includes both PY5 *ex ante* savings, as well as carryover savings from PY4 (see Table 45).

[b] This value is an average of PY3 NTGRs by product category, weighted by PY5 *ex post* gross savings.

4.4 INPUTS FOR FUTURE PROGRAM PLANNING

In PY5, the evaluation team gathered data to update the Standard Program's lighting and steam trap NTGRs for application in PY7. Consistent with prior program years, the NTGR developed in PY5 is based on self-reported information from the CATI participant survey with Core participants, which quantifies the percentage of the gross program impacts that can reliably be attributed to the program. Further, we calculated each of the two NTGRs based on both the level of free ridership and participant spillover for the program. Appendix C provides detailed information about the methodology, as well as the results.

4.4.1 UPDATED NTGRS FOR PY7

Table 50 below provides the updated lighting and steam trap NTGRs for the Standard Program. These values will be applied in PY7. Note that this is the first year for which the team has provided a NTGR for stream traps.

Table 51. Updated Standard NTGRs for PY7

End-Use	Free Ridership	Spillover	NTGR (1-FR+SO)
Lighting	0.26	0.03	0.77

End-Use	Free Ridership	Spillover	NTGR (1-FR+SO)
Steam Traps	0.10	–	0.90

4.4.2 NON-PARTICIPANT SPILLOVER

As part of the PY5 evaluation effort, we assessed non-participant spillover. Non-participant spillover refers to energy efficiency installations that were influenced by a customer's knowledge of the ActOnEnergy Program, but did not receive an incentive. We examined spillover using responses to the non-participant telephone survey, and found that 1.2% of the surveyed decision-makers took action and attributed it to the program. The most common type of equipment installed outside the program was efficient lighting, followed by water heating and cooling equipment. Appendix C provides additional explanation of our findings in this area.

4.4.3 ONLINE STORE INSTALLATION RATES

The evaluation team verified the installation and operation of individual Online Store measures based on responses to the participant survey. The resulting installation rates are for future planning purposes only. The team did not apply these values to determine PY5 *ex post* savings.

Table 51 shows the measure-specific installation rates for the Online Store. Note that an overall kit-level installation rate is calculated based on electric savings for the 3 CFL/3 LED kits. This is due to differences in the installation rates for CFLs and LEDs within the kit.

Table 52. Online Store Measure Installation Rates

Measure	Installed	Verified	Installation Rate	Precision
6 CFL Kit	822	511	62%	± 0.04
4 CFL/2 LED Kit	126	93	74%	± 0.07
LED Exit Sign	103	77	75%	± 0.08
Specialty CFLS	126	100	79%	± 0.07
Spiral CFLs	354	180	51%	± 0.06
T8 Ballast	256	252	98%	± 0.01
T8s	360	338	94%	± 0.02
LEDs	319	237	74%	± 0.05
Measure	**Gross kWh Pre-ISR**	**Gross kWh Post-ISR**	**Installation Rate**	**Precision**
3 CFL/3 LED Kit	43,757	33,115	76%	± 0.03

A. APPENDIX: DATA COLLECTION INSTRUMENTS

AIC PY5 Online Store Survey FINAL 2

AIC PY5 CI Standard Survey FINAL 2013-0

Ameren PY5 CI Non-Participant Sur

B. APPENDIX: SURVEY RESPONSE RATE METHODOLOGY

Given that survey response rates are calculated and presented for all of the program surveys, we present a definition and explanation of how the rate is calculated here. The survey response rate is the number of completed interviews divided by the total number of potentially eligible respondents in the sample. We calculated the response rate using the standards and formulas set forth by the American Association for Public Opinion Research (AAPOR).[19] For various reasons, we were unable to determine the eligibility of all sample units through the survey process, and chose to use AAPOR Response Rate 3 (RR3). RR3 includes an estimate of eligibility for these unknown sample units. The formulas used to calculate RR3 are presented below. The definitions of the letters used in the formulas are displayed in the Survey Disposition tables in the Evaluation Methods section of the report.

$$E = (I + R + NC) / (I + R + NC + e)$$

$$RR3 = I / ((I + R + NC) + (E*U))$$

We also calculated a cooperation rate, which is the number of completed interviews divided by the total number of eligible sample units actually contacted. In essence, the cooperation rate gives the percentage of participants who completed an interview out of all of the participants with whom we actually spoke. We used AAPOR Cooperation Rate 1 (COOP1), which is calculated as:

$$COOP1 = I / (I + R)$$

The approach to calculating response rates differs slightly for Internet-based surveys. In these instances, the survey response rate is the number of completed surveys divided by the total number of potentially eligible respondents in the sample. The quality of the email list is a key factor in determining the eligibility of participants who do not respond to the email but also do not bounce back. This calculation assumes a high-quality list in which all respondents are eligible except those who reply with an accepted reason why they are not eligible (e.g., employee of client).

[19] *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*, AAPOR, 2011. http://www.aapor.org/AM/Template.cfm?Section=Standard_Definitions2&Template=/CM/ContentDisplay.cfm&ContentID=3156.

C. APPENDIX: NTGR RESULTS

In PY5, the evaluation team was tasked with gathering data to update the Standard Program's lighting and steam trap NTGRs for application in PY7. As a result, we conducted research with Core Program participants to update existing values. Consistent with prior program years, the NTGR developed in PY5 is based on self-reported information from the CATI survey that quantifies the percentage of the gross program impacts that can reliably be attributed to the program.

Additionally, we fielded a nonparticipant survey to gather information regarding possible spillover. Because the nonparticipant spillover (NPSO) could be derived from any C&I program implemented by AIC, we used the impacts from all C&I programs (i.e., Custom, Standard, and Retro-Commissioning) to calculate the NPSO value. For this draft report, we include only the interim gross impacts for the Custom Program as the net impacts are not yet finalized. However, we will update these results when the net impacts are available from the Custom Program.

Methodology

Core Standard Program

Free Ridership

Free riders are program participants who would have implemented the incented energy-efficient measure(s) even without the program. These estimates are based on a series of questions that explore the influence of the program in making the energy-efficient installations as well as likely actions had the incentive not been available. For the majority of Standard Program projects included in the surveys, we developed a net-to-gross factor that consists of three scores: overall influence, influence of program components, and influence of program timing.[20]

1. **Overall Influence**. This score is based on two survey questions. The first question asked respondents to rate the importance of the program compared to the importance of other factors in their decision to implement the energy-efficient equipment. To do so, respondents were asked to divide 100 points between program and non-program factors. This score is equal to the number of points given to the program divided by 10. The second question asked if respondents had learned about the program before or after they decided to implement the energy-efficient equipment rather than standard-efficiency equipment. If respondents learned about the program after deciding to install energy-efficient equipment, the value from the first question (the total points given divided by 10) is halved. As a result, greater importance of the program means lower level of free ridership.

   For example, if a respondent gave the program 70 points out of 100, the first component of the overall influence score would be 7 (70/10). If that same respondent said they learned about the program before they decided to implement the energy-efficient equipment, their score would remain a 7. However, if they said they learned about the program after they decided to implement the energy-efficient equipment, their score would be divided in half and equal 3.5 (7/2)

[20] This algorithm is based on the basic rigor self-report method used in California, and is the same method used for the ComEd C&I programs.

2. **Influence of Program Components**. This score is based on a series of four questions. These questions asked respondents to rate the importance of four program components, on a scale of 0 to 10 (where 0 is "Not at all important" and 10 is "Very important"): the incentive amount, program marketing materials, recommendation from program staff, and recommendation from a utility account manager. This score is equal to the highest rating given to any one of these components. Greater importance of the program components means lower level of free ridership.

   In this case, if a respondent rated the program rebate 10 out of 10, the recommendation of program staff 8 out of 10, and the information from program materials 8 out of 10, the final Influence of Program Components score would be a 10 (the highest of all the scores given).

3. **Influence of Program Timing.** This score is developed based on three questions: 1) the likelihood that the exact same equipment would have been installed without the program (on a scale of 0 to 10); 2) if the installation would have been done at the same time without the program; and 3) if the installation would have been done later, how much later. This score takes the response to the likelihood question and adjusts this value by the responses to the timing questions. A greater likelihood of participating without the program means higher level of free ridership. Later implementation without the program means lower level of free ridership.

   For example, if the participant says they would have installed the same equipment at the same time, they are considered a full free rider for this part of our net-to-gross index. If they likely would have installed the equipment (a rating between 7 and 10) but would have done it later, they are considered a partial free rider and the influence of the program is higher. Information about how much later (determined by question #3) helps us to assign a free ridership value. If the customer would not have installed the same equipment until four years later, we do not consider them a free rider for this component of the net-to-gross index (i.e., the program is given full influence on the timing of the installation).

Each score can take on a value of 0 to 10, where a higher score means a lower level of free ridership. The overall net-to-gross factor for a project is the average of the three scores, divided by 10. The net-to-gross factor for each project thus ranges from 0 (100% free ridership) to 1 (no free ridership).

For larger projects, this approach is supplemented with findings from interviews with trade allies where the participant indicates they played an important role in their decision to participate in the program.[21] There were 10 Standard Rigor NTGR projects in PY5, however none of their survey responses triggered interviews with trade allies or a key account executive.

Participant Spillover

We examined spillover using participant responses to the phone survey, as well as callbacks where needed. Based on this data, we found spillover among four Standard Program participants in the AIC service territory. We conducted an engineering assessment of participant responses and gathered additional information via follow-up interviews to determine the savings associated with measures installed outside of the program. Each of these participants was influenced by the

[21] Projects with estimated *ex ante* kWh savings of 750,000 kWh or more were assessed under this Standard rigor approach.

program to install additional lighting equipment including LEDs, T8s, and lighting controls. In addition, one respondent implemented a VFD project.

Non-Participant Spillover

We examined spillover using responses to the non-participant telephone survey, and found that 1.2% of the decision-makers took action and attributed it to the ActOnEnergy Business Program. The most common type of equipment installed outside the program was efficient lighting, followed by water heating and cooling equipment.

We developed estimates of the savings associated with these measures based on an engineering analysis of participant survey responses, as well as follow-up interviews performed by engineering staff. Based on the information gathered, we were able to perform engineering-based calculations or use the Statewide TRM to calculate savings.

Standard Program Core NTGR Results

Table 52 presents the results of our PY5 data collection to inform an updated lighting and steam trap NTGR for application in PY7. We found spillover among four program participants.

Table 53. Updated Standard NTGRs for PY7

End-Use	Free Ridership	Spillover	NTGR (1-FR+SO)
Lighting	0.26	0.03	0.77
Steam Traps	0.10	–	0.90

Note that this is the first year for which the team has provided a NTGR for stream traps. The value established is higher than the planning value of 0.80 used previously to assess net impacts. In addition, the updated value for lighting is consistent with prior program years, which illustrates that decision-making has not changed markedly as a result of EISA.

Spillover

Participant spillover refers to energy efficiency installations that were influenced by the program but did not receive an incentive. An example of participant spillover is a customer who installed incented equipment in one facility and, as a result of the positive experience, installs additional equipment at other facilities but does not request an incentive (outside spillover). In addition, the participant may install additional equipment at the same facility because of the program (inside spillover).

We examined both inside and outside spillover in projects from the lighting end-use using participant responses to the phone survey.[22] Based on this data, spillover was found among four Standard participants in the AIC service territory. We conducted an engineering assessment of participant responses to determine the savings associated with measures installed outside of the program.

[22] No spillover was found among steam trap projects.

Table 54. Spillover Measures and Savings

Spillover Measure	Total kWh
Lighting Controls/Occupancy Sensors	146,640
LEDs	81,909
Linear Fluorescent T8	22,640
VFDs	5,499
Total	**256,688**

The total spillover reported by the lighting sample equaled 257 MWh, while total gross savings of the participant sample equaled 7,702 MWh. The following equation provided the program spillover rate:

$$Spillover\ \% = \frac{Total\ participant\ sample\ spillover\ (MWh)}{Total\ participant\ sample\ savings\ (MWh)} = \frac{257\ MWh}{7{,}702\ MWh} = 3.34\%$$

Non-Participant Spillover

The evaluation team calculated savings for each measure identified by the three non-participants who were influenced by the program. As shown in Table 54 below, lighting measures contributed the majority of savings and the total spillover reported by the non-participant sample equaled 120,859 kWh. The average savings achieved per non-participant with spillover is 40,286 kWh. However, the majority of savings came from one non-participant (117,632 kWh), who installed significant quantities of CFL and LED bulbs at their facilities.

Table 55. Non-Participant Spillover Measures and Savings

Spillover Measure	Total kWh
CFLs	86,771
LEDs	26,825
Linear Fluorescent T8s	3,160
Electric Storage Water Heaters	1,809
Packaged Cooling Units	2,295
Total	**120,859**

As shown in Table 55, when applied to all 255 completes, the average savings per non-participant is 474 kWh. This brings the total spillover in the non-participant population to 62,390 MWh, which illustrates that significant savings can be achieved by influencing a relatively small number of customers.

Table 56. Non-Participant Spillover Summary

	n	kW	kWh
N accounts in sample	255		
Spillover per account		0.06	474
Accounts in sample frame	131,637		
Spillover in the population		8,289	62,390,209

Given the scale of these results, we considered the potential influence of incorrect reporting by respondents, as well as potential non-response bias. While the former is a key consideration, it

cannot be addressed without site visits to verify installation of the claimed measures or further verification efforts that are beyond the scope of this study.[23] In terms of non-response bias, unfortunately the team was limited by the data provided for sampling purposes and could not assess whether respondents and non-respondents were similar in terms of usage or business type among other considerations.

As a result, we went forward and calculated a non-participant spillover value by adding the spillover savings to *ex post* net savings from the C&I portfolio.[24] We then divide this total *ex post* net savings by the *ex post* gross savings associated with the portfolio to develop an updated NTGR for the portfolio. From that value, we can determine the non-participant spillover proportion.

Using this approach, the level of non-participant spillover has a significant effect on the portfolio's NTGR. As shown in Table 56, the overall non-participant spillover value is 0.32. Table 56 also illustrates the impact this value has on the overall portfolio NTGR.

Table 57. Draft Non-Participant Spillover Value

	Gross Savings		Net Savings	
	kW	kWh	kW	kWh
Spillover	-	-	8,289	62,390,209
Portfolio	35,837	194,493,100	28,281	151,985,326
		Total	36,570	214,375,536

Portfolio NTGR w/out NPSO	0.78
Portfolio NTGR with NPSO	1.10
NPSO Value	0.32

Note: The gross and net impact values included here are draft.

We recommend further discussion of these results and their potential impact with AIC and ICC staff. The team may also propose additional research in PY6 to further assess non-participant spillover.

[23] We had called back these participants during the evaluation of spillover to discuss the measures.

[24] Note that we do not yet have final gross impacts for the Custom Program. Once Custom impacts are finalized, we will update the NPSO value. Because any change to the Custom gross and net impacts will affect the portfolio equally, the NPSO value is expected to remain the same.

D. APPENDIX: INSTALLATION RATE RESULTS

The evaluation team verified the installation and operation of individual Online Store measures based on responses to the participant survey. As part of the survey, we asked participants to verify that they received the quantity of measures tracked in the program data. To calculate the installation rate, the team divided the number of verified measures by the number reported in the program-tracking data.

The remainder of this appendix outlines the PY5 installation rates, which are for future planning purposes only. The team did not apply these values to determine PY5 *ex post* savings.

Table 57 shows the measure-specific installation rates for the Online Store. Note that an overall kit-level installation rate is calculated based on electric savings for the 3 CFL/3 LED kits. This is due to differences in the installation rates for CFLs and LEDs within the kit.

Table 58. Online Store Measure Installation Rates

Measure	Installed	Verified	Installation Rate	Precision
6 CFL Kit	822	511	62%	± 4%
4 CFL/2 LED Kit	126	93	74%	± 7%
LED Exit Sign	103	77	75%	± 8%
Specialty CFLS	126	100	79%	± 7%
Spiral CFLs	354	180	51%	± 6%
T8 Ballast	256	252	98%	± 1%
T8s	360	338	94%	± 2%
LEDs	319	237	74%	± 5%
Measure	**Gross kWh Pre-ISR**	**Gross kWh Post-ISR**	**Installation Rate**	**Precision**
3 CFL/3 LED Kit	43,757	33,115	76%	± 3%

E. APPENDIX: COST-EFFECTIVENESS INPUTS

Table 58 contains savings inputs for cost-effectiveness calculations. These values differ from those presented in the main report due to the inclusion of heating penalties.

Table 59. Gross Program Savings for Cost-Effectiveness

Project Type	*Ex Ante* Gross			*Ex Post* Gross			Realization Rate		
	MW	MWh	Therm	MW	MWh	Therm	MW	MWh	Therm
Core	16,819	98,744	2,040,058	16,733	98,573	2,040,058	0.99	0.99	1.00
Online Store	–	27,115	–	–	24,309	(19,736)	–	0.90	–
Green Nozzle	–	134	22,923	–	134	22,923	–	1.00	1.00
Total	**16,819**	**125,993**	**2,062,981**	**16,733**	**123,016**	**2,043,245**	**0.99**	**0.98**	**0.99**